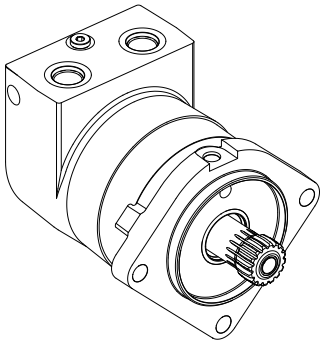
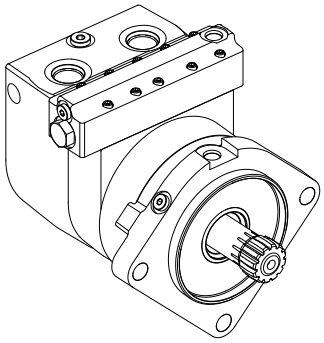
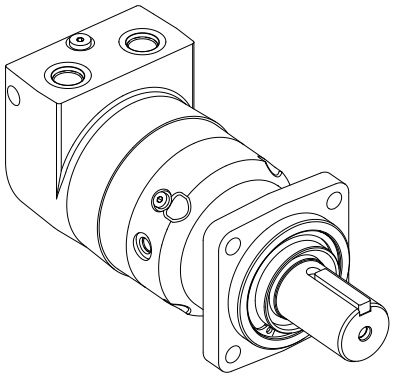
Char-Lynn®
HP30 Motors

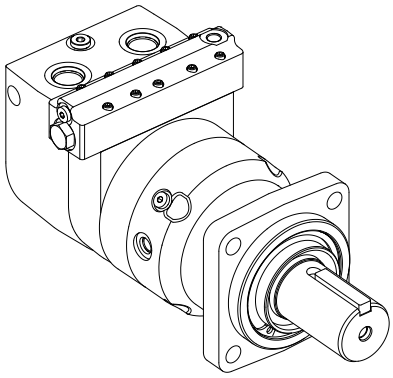
Design code - 002

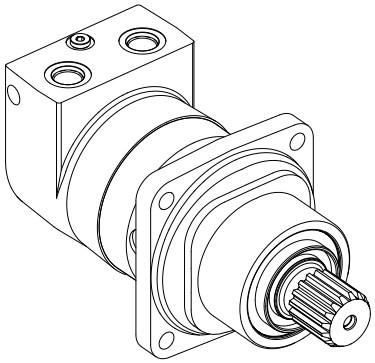
Parts and repair information

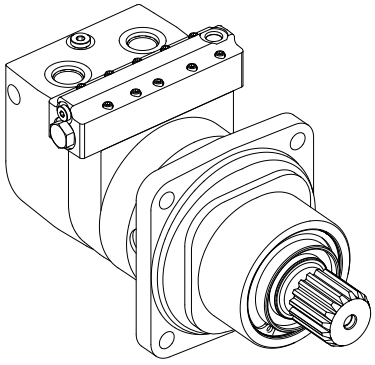












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Bearingless motors

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Standard and wheel motor

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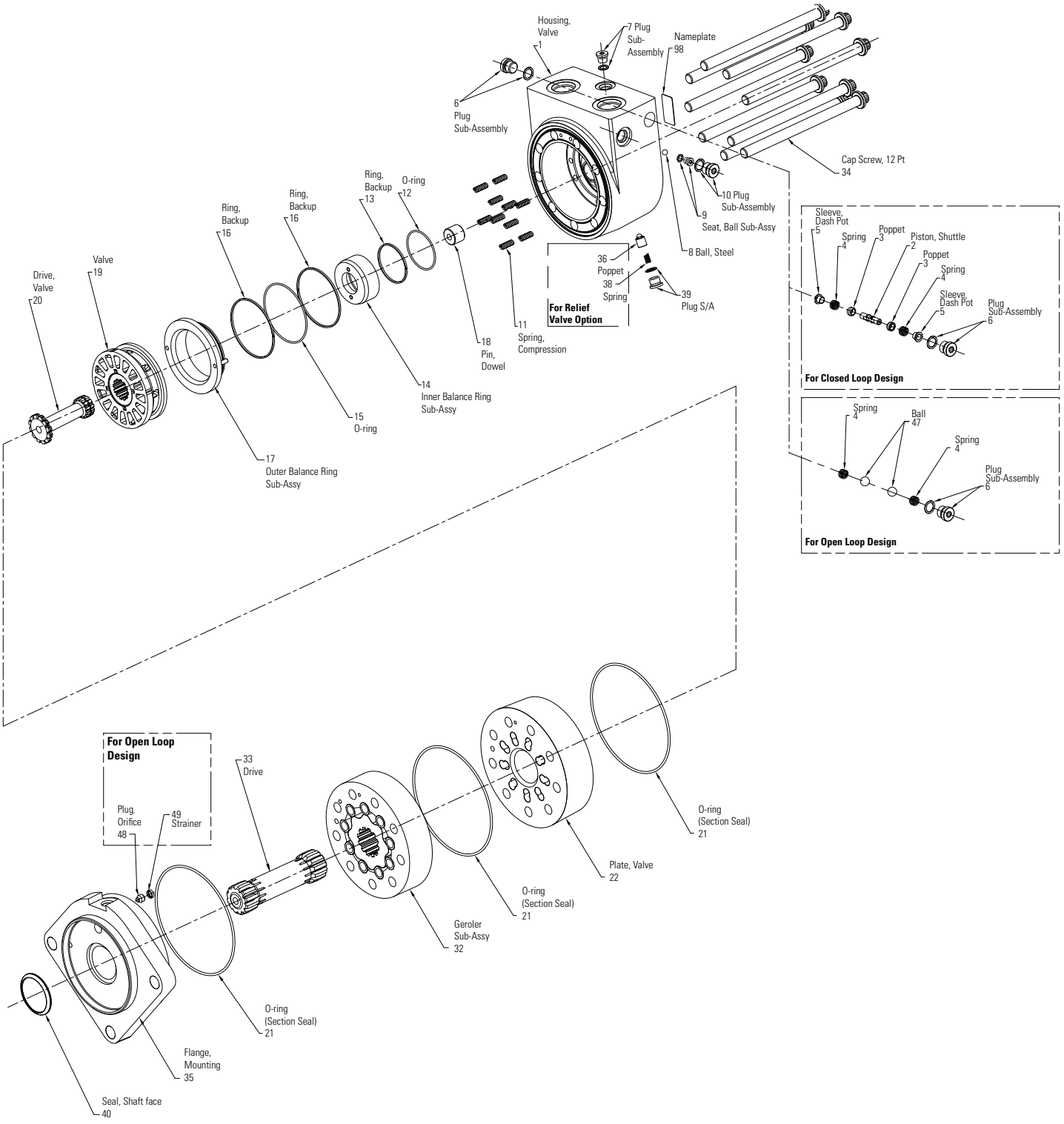
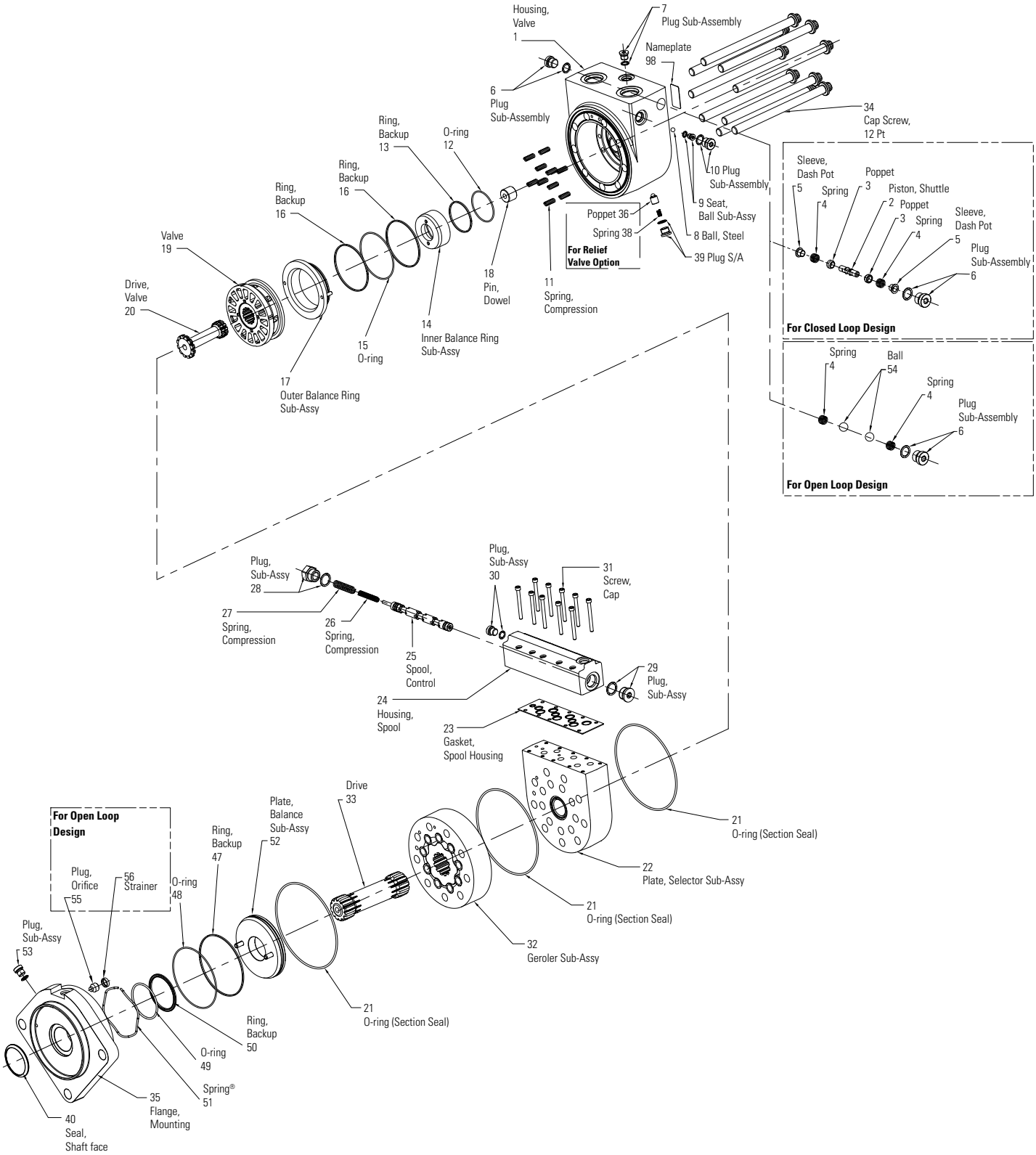
Exploded View
(Single Speed - Bearingless Motor)



Exploded View
(Two Speed - Bearingless Motor)



Part List
(Single Speed - Bearingless Motor)

Item Description

	Ref No.	Part No.	Description	Quantity
	1	5998727-001 5998727-007	Housing, Valve 1.0625-12 UN-2B SAE O-Ring Ports (2) Housing, Valve G 1 BSP Straight Thread Ports	1 1
	2	201494-002	Piston, Shuttle	1
	3	8567-000	Poppet	2
	4	230079-000	Spring	2
	5	112126-001	Sleeve, Dash Pot	2
	6	9266-006	Plug Sub-Assembly	2
X		250003-904	O-ring	2
	7	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	8	18026-000	Ball, Steel	1
	9	5992342-001	Seat, Ball Sub-Assy	1
X		250003-902	O-ring	1
	10	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	11	6203-000	Spring, Compression	10
X	12	14502-032	O-ring	1
X	13	5989483-001	Ring, Backup	1
	14	5991782-001 268009-005	Inner Balance Ring Sub-Assy Pin, Roll	1 2
X	15	14502-040	O-ring	1
X	16	5989483-002	Ring, Backup	2
	17	5991783-001 268009-005	Outer Balance Ring Sub-Assy Pin, Roll	1 2
	18	5987800-001	Pin, Dowel	1
	19	5987445-001	Valve	1
	20	5987844-001	Drive, Valve	1
X	21	250002-161	O-ring (Section Seal)	3
	22	5989335-001	Plate,Valve	1
	32	*	Geroler Sub-Assy	1
	33	*	Drive, Main	1
	34	*	Cap Screw, 12 PT	9
	35	5987755-007 5987755-009	Flange, Mounting Shuttle Valve With .5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flange . Flange, Mounting Check Valve With Orifice Plug, 5625-18 UNF-2B SAE O-Ring Case Drain Port In Valve Housing	1 1
	36	113538-001	Poppet (for relief valve unit only)	1
	38	113186-001	Spring (for relief valve unit only)	1
	39	9072-006	Plug Sub-Assembly	1
X		250003-905	O-ring	
X	40	9080-001	Seal, Shaft Face	1
	47	285020-140	Ball (for open loop design only)	2
	48	9289-001	Plug, Orifice (for open loop design only)	1
	49	31500-452 9900847-000	Strainer (for open loop design only) Seal Kit - Contains Parts Indicated by X	 1

* = See Chart

Part List
(Single Speed - Bearingless Motor)

Displacement	Ref. No. 32	Width	Ref. No. 33	Length	Ref. No. 34	Length
cm³/r [in3/r]	Geroler	mm [inch]	Drive	mm [inch]	Cap Screw	mm [inch]
343.8 [20.98]	5991701-001	32,1 [1.26]	5992182-001	130,4 [5.13]	114154-025	185,2 [7.29]
400.0 [24.40]	5991701-002	37,3 [1.47]	5992182-002	135,7 [5.34]	114154-026	190,5 [7.50]
434.2 [26.50]	5991701-006	40,6 [1.60]	5992182-006	138,9 [5.47]	114154-026	190,5 [7.50]
479.5 [29.26]	5991701-003	44,7 [1.76]	5992182-003	143,1 [5.63]	114154-027	197,9 [7.79]
677.3 [41.33]	5991701-007	63,2 [2.49]	5992182-008	161,2 [6.35]	114154-029	216,4 [8.52]

Part List
(Two Speed - Bearingless Motor)

Item description

	Ref No.	Part No.	Description	Quantity
	1	5998727-001	Housing, Valve 1.0625-12 UN-2B SAE O-Ring Ports (2)	1
		5998727-007	Housing, Valve G 1 BSP Straight Thread Ports (2)	1
	2	201494-002	Piston, Shuttle	1
	3	8567-000	Poppet	2
	4	230079-000	Spring	2
	5	112126-001	Sleeve, Dash Pot	2
	6	9266-006	Plug Sub-Assembly	2
X		250003-904	O-ring	2
	7	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	8	18026-000	Ball, Steel	1
	9	5992342-001	Seat, Ball Sub-Assy	1
X		250003-902	O-ring	1
	10	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	11	6203-000	Spring, Compression	10
X	12	14502-032	O-ring	1
X	13	5989483-001	Ring, Backup	1
	14	5991782-001	Inner Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
X	15	14502-040	O-ring	1
X	16	5989483-002	Ring, Backup	2
	17	5991783-001	Outer Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
	18	5987800-001	Pin, Dowel	1
	19	5987445-001	Valve	1
	20	5987844-001	Drive, Valve	1
X	21	250002-161	O-ring (Section Seal)	3
	22	5991781-001	Plate, Selector Sub-Assy	1
		5989384-001	Insert, Sleeve	1
X	23	5990046-001	Gasket, Spool Housing	1
	24	5989326-002	Housing, Spool	1
	25	112850-002	Spool, Control	1
	26	112211-001	Spring, Compression	1
	27	114587-001	Spring, Compression	1
	28	9151-002	Plug Sub-Assembly	1
X		250003-908	O-ring	1
	29	9072-006	Plug Sub-Assembly	1
		250003-908	O-ring	1
X	30	9266-003	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	31	16148-320	Screw, Cap	10
	32	*	Geroler Sub-Assy	1
	33	*	Drive, Main	1
	34	*	Cap Screw, 12 PT	9

Part List
(Two Speed - Bearingless Motor)

Item description

	Ref No.	Part No.	Description	Quantity
	35	5991797-005	Flange, Mounting Shuttle Valve With .5625-18 UNF-2B SAE O-Ring Case Drain Port	1
		5987755-010	Flange, Mounting Shuttle Valve With .5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flange .	1
	36	113538-001	Poppet (for relief valve unit only)	1
	38	113186-001	Spring (for relief valve unit only)	1
	39	9072-006	Plug Sub-Assembly	1
X		250003-905	O-ring	1
X	40	9080-001	Seal, Shaft Face	1
X	47	5989483-004	Ring, Backup	1
X	48	112530-044	O-ring	1
X	49	112530-139	O-ring	1
X	50	14649-003	Ring, Backup	1
	51	6023120-001	Spring	1
	52	6023947-001	Plate, Balance Sub-Assy	1
	53	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	54	285020-140	Ball (for open loop design only)	2
X	55	9289-001	Plug, Orifice (for open loop design only)	1
X	56	31500-452	Strainer (for open loop design only)	1
		9900682-000	Seal Kit Contains Parts Indicated by X	

* = See Chart

Displacement	Ref. No. 32	Width	Ref. No. 33	Length	Ref. No. 34	Length
cm³/r [in3/r]	Geroler	mm [inch]	Drive	mm [inch]	Cap Screw	mm [inch]
343.8 [20.98]	5991701-001	32,1 [1.26]	5992182-001	130,4 [5.13]	114154-025	185,2 [7.29]
400.0 [24.40]	5991701-002	37,3 [1.47]	5992182-002	135,7 [5.34]	114154-026	190,5 [7.50]
434.2 [26.50]	5991701-006	40,6 [1.60]	5992182-006	138,9 [5.47]	114154-026	190,5 [7.50]
479.5 [29.26]	5991701-003	44,7 [1.76]	5992182-003	143,1 [5.63]	114154-027	197,9 [7.79]
677.3 [41.33]	5991701-007	63,2 [2.49]	5992182-008	161,2 [6.35]	114154-029	216,4 [8.52]

Disassembly
(Single and Two speed Bearingless Motor)

Tools required

- 7/32 inch Hex Key (Relief Valve Plug)
- 1/4 inch Hex Key (Shuttle Valve Plug)
- 5/16 inch Hex Key (Spool Housing Plug)
- 5/32 inch Hex Key (Spool Housing Screw, Cap)
- 7/8 Socket
- 9/16 Socket (12 Point Drive)
- Torque wrench - 142 Nm [1260 lb-in] capacity

3.0 Disassembly

3.0.1 Cleanliness is extremely important when repairing hydraulic motors. Work in a clean area. Before disconnecting the hydraulic motor thoroughly clean the exterior. Remove motor from application and drain the oil from the motor before disassembly.

3.0.2 Remove the 9 cap screws and disassemble the motor in the vertical position as shown in Figure 1A & 1B.

3.0.3 Remove shuttle valve (and relief valve if applicable) from Valve Housing.

3.0.4 Check all mating surfaces. To reduce the chance of leakage, replace any parts that have scratches or burrs. Wash all metal parts in clean solvent. Blow them dry with pressurized air. Do not wipe parts dry with paper towels or cloth as lint in a hydraulic system will cause damage.

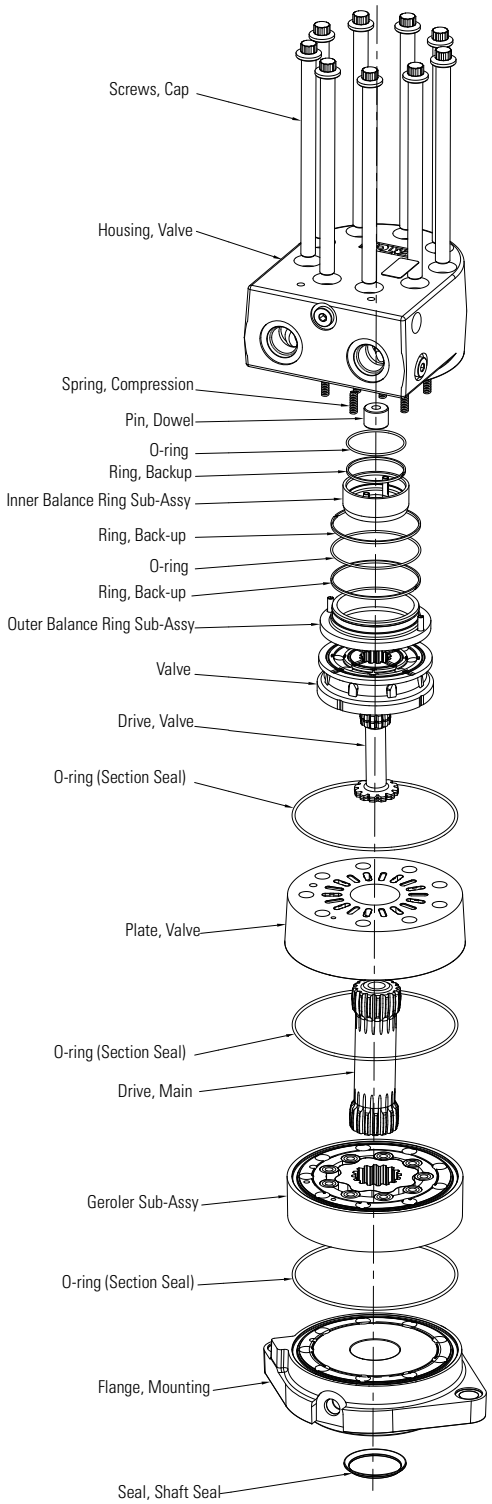


Figure 1A
(Single Bearingless Motor)

Disassembly
(Single and Two Speed Bearingless Motor)

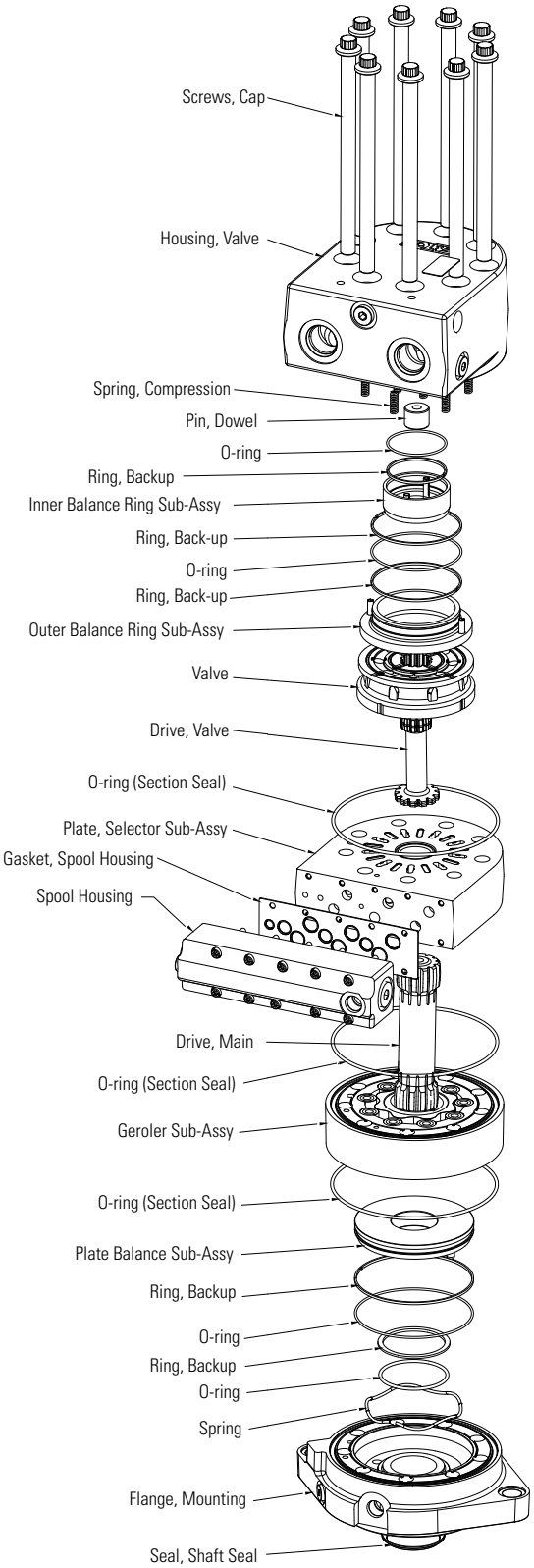


Figure 1B

(Two Speed Bearingless Motor)

Reassembly
(Single and Two Speed Bearingless Motor)

Note: Always use new seals when reassembling hydraulic motors. Refer to parts list for seal kit number and replacement parts.

Important: During reassembly, lubricate the new seals with a petroleum jelly such as Vaseline®. Also lubricate machined surfaces with clean hydraulic fluid.

4.0 Valve housing assembly

4.0.1 Install one poppet, spring, dash pot and threaded internal hex plug with O-ring into shuttle valve bore from one end of Valve Housing.

4.0.2 Install shuttle piston from opposite end of shuttle valve cavity.

4.0.3 Install one shuttle valve poppet, spring, dash pot onto piston and threaded internal hex plug with O-ring from opposite end of shuttle valve cavity.

4.0.4 Shuttle plug threads may have light coat of oil or preservative. Torque both plugs to 360 +/- 36 lbf-in.

4.0.5. For a motor with open loop design, Install Ball, Spring and threaded internal hex plug with O-ring form one end of cavity. And then install another Ball, Spring and threaded internal hex plug with O-ring from opposite end of cavity. Torque both plugs to 360 +/- 36 lbf-in. Plugs may have light coat of oil or preservative.

4.0.6. For a motor with low pressure relief valve, install poppet, spring and plug. Plug threads may have light coat of oil or preservative. Torque plug to 180+/-18 lb-in.

4.0.7. For a motor without low-pressure relief valve, Install and torque plug to 180 ± 18 lbf-in. Plug may have light coat of oil or preservative.

4.0.8. Install ball and seat ball sub-assembly. Torque seat to 60 +/- 6 lbf-in. Install plug sub-assembly and torque to 360 +/- 36 lbf-in.

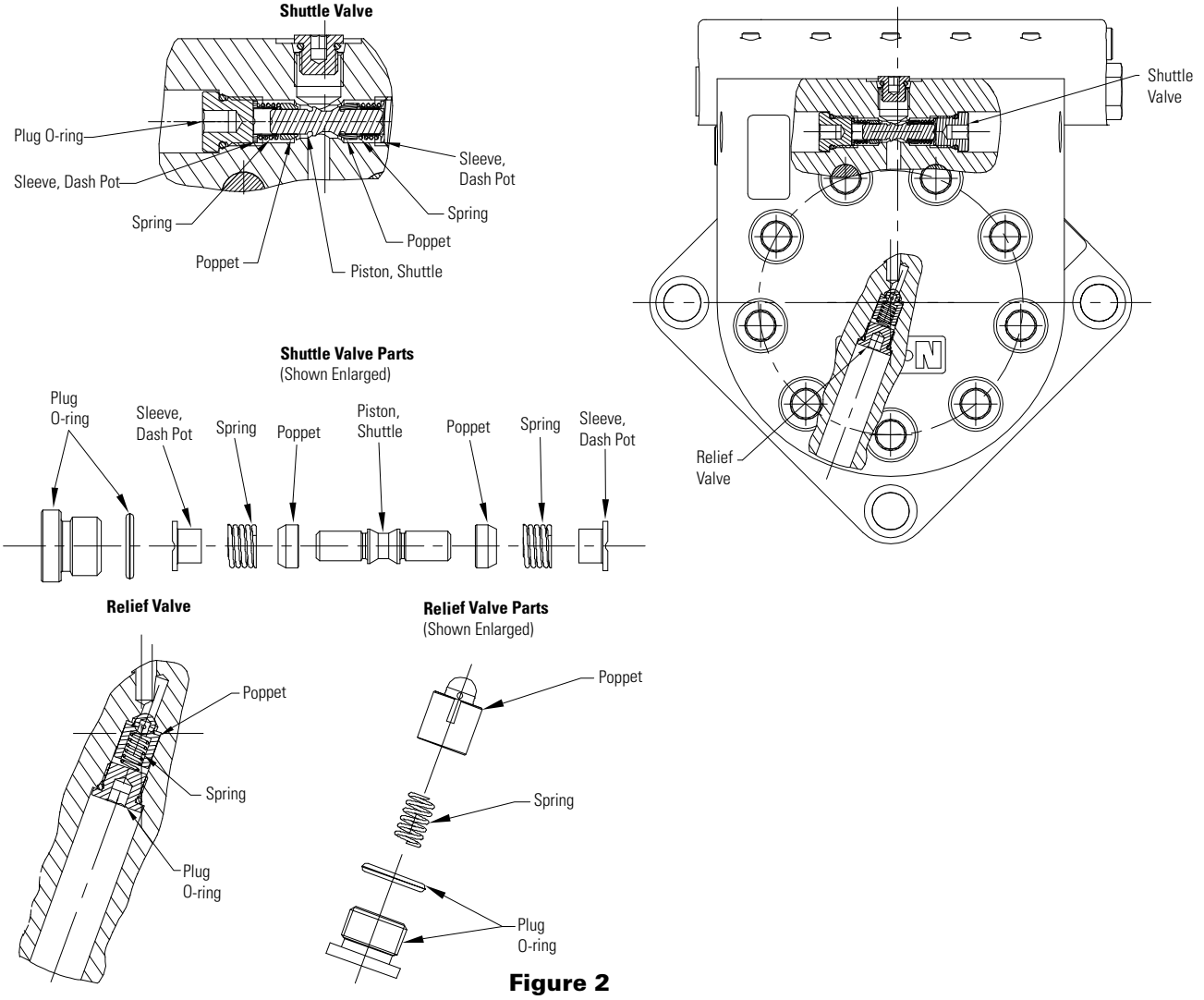


Figure 2

Reassembly
(Single and Two Speed Bearingless Motor)

4.1 Outer balance ring assembly

4.1.1 Install one backup ring (75,1 [2.96] OD), then one O-ring (72,7 [2.86] ID) followed by one backup ring (75,1 [2.96] OD) into the O-ring groove in the outer balance ring. Seals and backups are to be greased. Ensure splits in backup rings are mated correctly. Location of splits in backup rings should not be aligned, a minimum of 90 degrees of separation is recommended.

4.1.2 Install one O-ring (47,3 [1.86] ID) then one backup ring (48,6 [1.91] OD) into the inner balance ring groove, located in the valve housing. Seal and backup are to be greased. Ensure split in backup ring is mated correctly.

4.1.3 Grease dowel pin and install in valve housing.

4.1.4 Install 10 balance ring springs in valve housing.

4.1.5 Install inner and outer balance ring sub-assemblies into valve housing. Ensure O-rings seals are seated.

4.1.6 Install greased O-ring section seal (139,4 [5.49] ID) in valve housing O-ring groove.

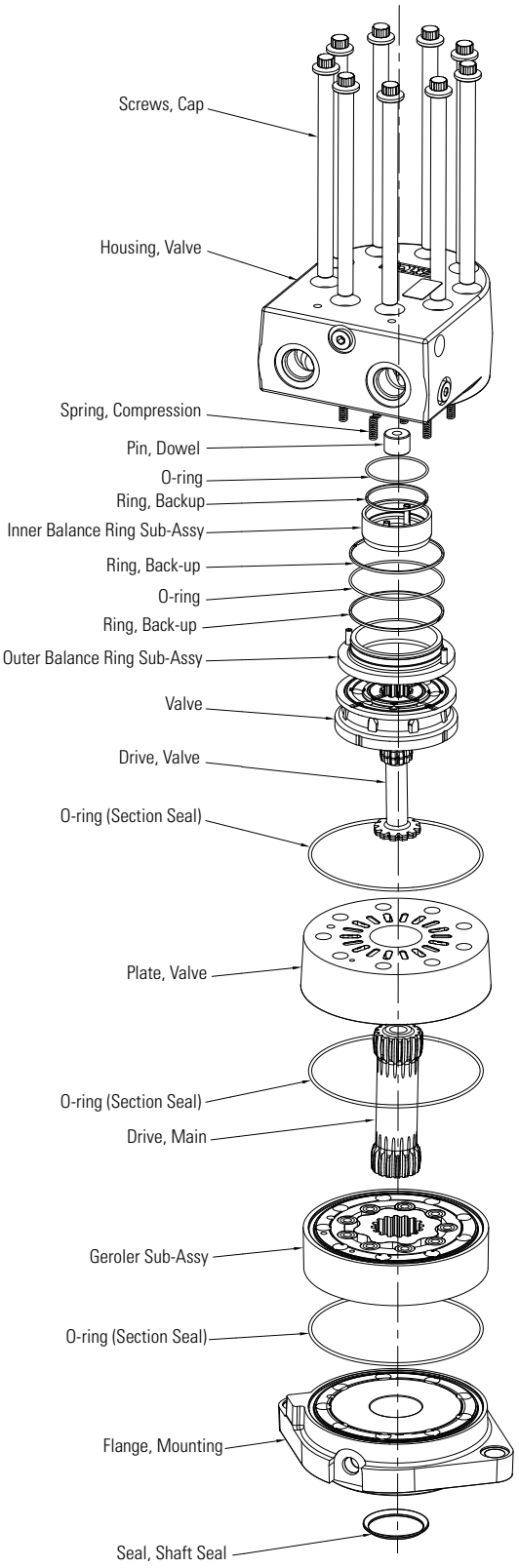


Figure 3A
(Single Speed Bearingless Motor)

Reassembly
(Single and Two Speed Bearingless Motor)

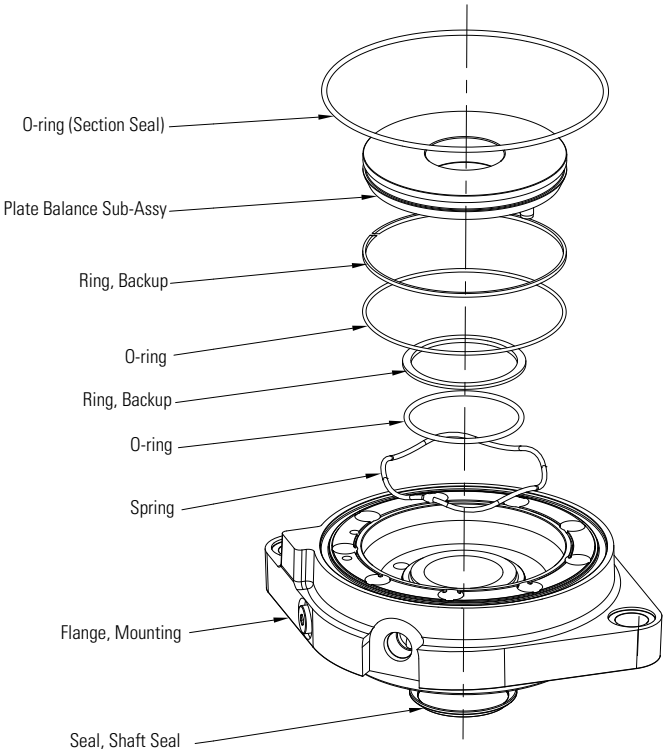


Figure 4

(Two Speed Bearingless Motor)

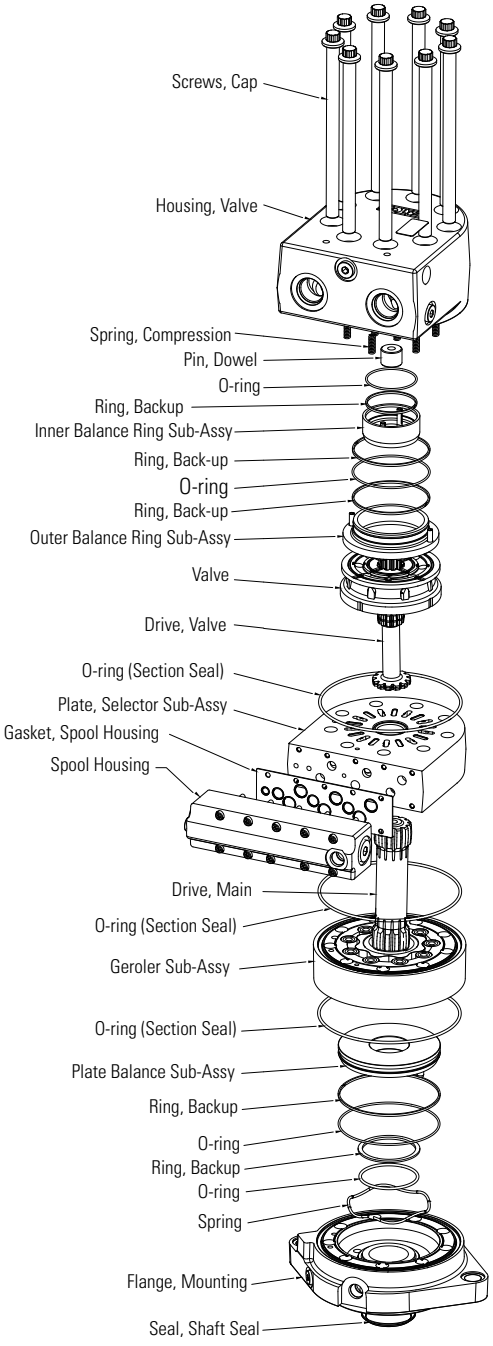


Figure 3B

(Two Speed Bearingless Motor)

Reassembly
(Single and Two Speed Bearingless Motor)

4.2 Flange assembly (For single speed bearingless motor)

4.2.1 Position flange on workbench with the O-ring grooves face down and install face seal (54,1 [2.13] OD).

4.3 Final assembly (For single speed bearingless motor)

4.3.1 Place drive in build fixture. Place mounting flange (seal grooves up) over drive.

4.3.2 Place Geroler assembly (seal groove up) over mounting flange. Install greased O-ring section seal (139,4 [5.49] ID) in seal groove of Geroler assembly. Align shuttle flow hole of Geroler with shuttle flow hole of mounting flange.

4.3.3 Mark drive teeth that align (See Figure A) with dykem pen. Install valve drive into internal star spline (See Figure B or C for motor timing).

4.3.4 Install valve plate onto Geroler sub-assembly (valve plate valve slots up). Align shuttle flow hole of valve plate with shuttle flow hole of Geroler sub-assembly.

4.3.5 Install valve onto valve drive and selector plate assembly. Ensure long leakage groove is aligned with marked tooth on valve drive (see Figure D).

4.3.6 Carefully invert valve housing and place onto valve plate. Make sure that shuttle flow holes are aligned.

4.3.7 Install nine cap screws lubricated with DTE-26. Pre-torque each in a crisscross pattern (see Figure 7) to 80+/-10 lb-ft. Finally, in a crisscross pattern, tighten screws to 105+/-5 lb-ft.

4.4 Flange assembly (For two speed bearingless motor)

4.4.1 Position flange on workbench with the O-ring grooves face down and install face seal (54,1[2.13] OD).

4.4.2 With mounting flange O-ring grooves up (see Figure 4), install O-ring section seal (139,4 [5.49] ID) into flange. Install back-up ring (62,1 [2.45] OD) over O-ring (55,2 [2.18] ID) with flat side up. Back-up ring and O-rings may be greased to assist in retaining parts.

4.4.3 Install spring in groove in mounting flange.

4.4.4 Install back-up ring (99,7 [3.93] OD) in groves of balance plate sub assembly and then install O-ring (95,0 [3.74] ID) over back-up ring from tapered side.

4.4.5 Install balance plate sub assembly in mounting flange with tapered side down.

4.4.6 Install plug at 41 degree from horizontal centerline while viewing from drive end (balance plate port), see Figure 5. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

4.5 Spool housing assembly (For two speed bearingless motor)

4.5.1 Install control spool into spool housing by first lubricating control spool with DTE26. Install control spool into spool bore, verifying that the control spool moves freely in bore.

4.5.2 Install nested springs and counter bored plug into end of spool housing spool bore. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

4.5.3 Install plug in opposite end of spool bore. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

4.5.4 Install plug into spool housing port and torque to 192 +/- 19 lbf-in.

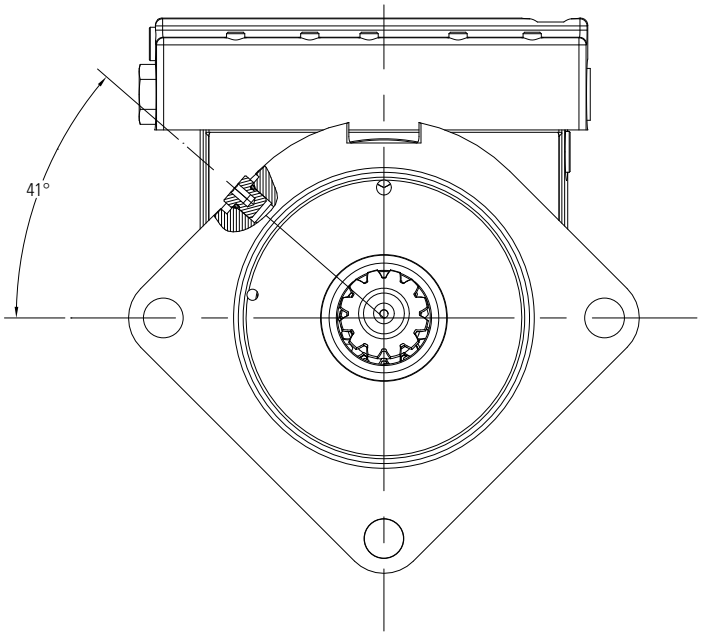


Figure 5

Reassembly
(Single and Two Speed Bearingless Motor)

4.6 Selector plate assembly (For two speed bearingless motor)

4.6.1 Apply 1 drop of Loctite 290 in all 10 screw holes in the selector plate while ensuring that no air is trapped underneath the droplet. Install the gasket onto the selector plate. Place the spool housing assembly onto the gasket. Install and torque each of the 10 screws starting in the middle working outwards using the sequence in Figure 6. Torque each screw to 70 +/- 8 lbf-in.

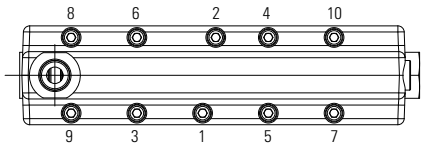


Figure 6

4.7 Final assembly (For two speed bearingless motor)

4.7.1 Place drive in build fixture. Place mounting flange (seal grooves up) over drive.

4.7.2 Place Geroler assembly (seal groove up) over mounting flange. Install greased O-ring section seal (139,4 [5.49] ID) in seal groove of Geroler assembly. Align shuttle flow hole of Geroler with shuttle flow hole of mounting flange.

4.7.3 Mark drive teeth that align (See Figure A) with dykem pen. Install valve drive into internal star spline (See Figure B or C for motor timing).

4.7.4 Install selector plate onto Geroler sub-assembly (selector plate valve slots up). Align shuttle flow hole of selector plate with shuttle flow hole of Geroler sub-assembly.

4.7.5 Install valve onto valve drive and selector plate assembly. Ensure long leakage groove is aligned with marked tooth on valve drive (see Figure D).

4.7.6 Carefully invert valve housing and place onto selector plate. Make sure that shuttle flow holes are aligned.

4.7.7 Install nine cap screws lubricated with DTE-26. Pre-torque each in a crisscross pattern (see Figure 7) to 80+/-10 lb-ft. Finally, in a crisscross pattern, tighten screws to 105+/-5 lb-ft.

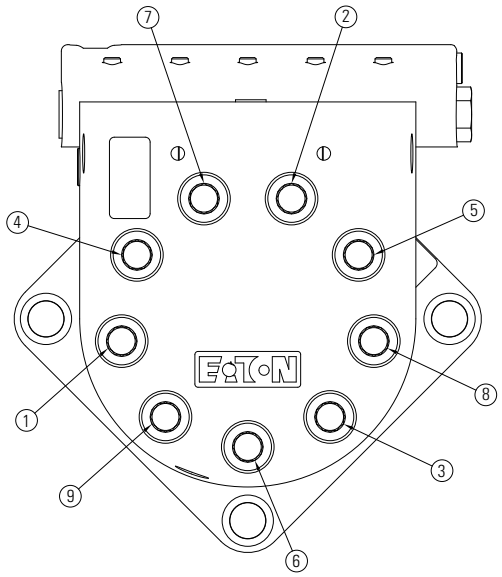


Figure 7

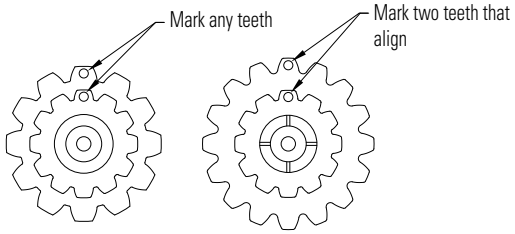


Figure A (Mark aligning teeth)

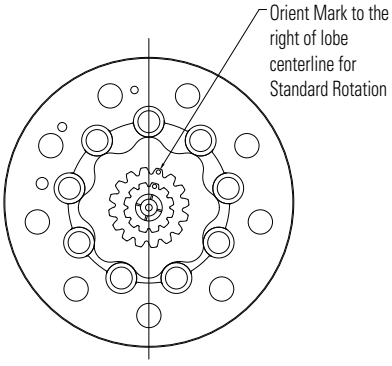


Figure B (Timing - Standard Rotation)

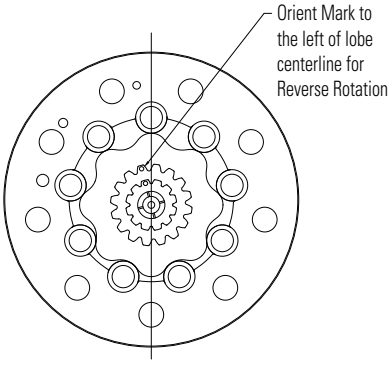


Figure C (Timing - Reverse Rotation)

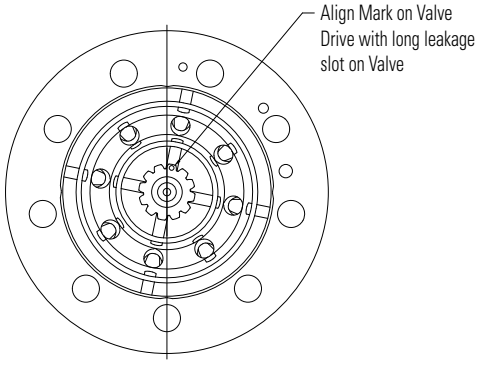


Figure D (Valve Orientation)

How to order replacement parts
(Single and Two Speed Bearingless Motor)

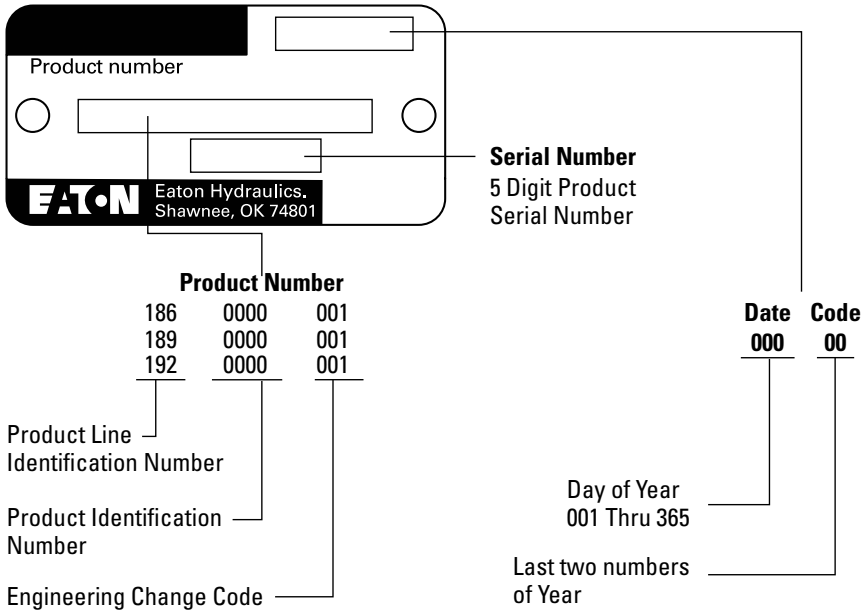
Each order must include the following:

Product Number
Date Code
Part Name
Part Number
Quantity of Parts

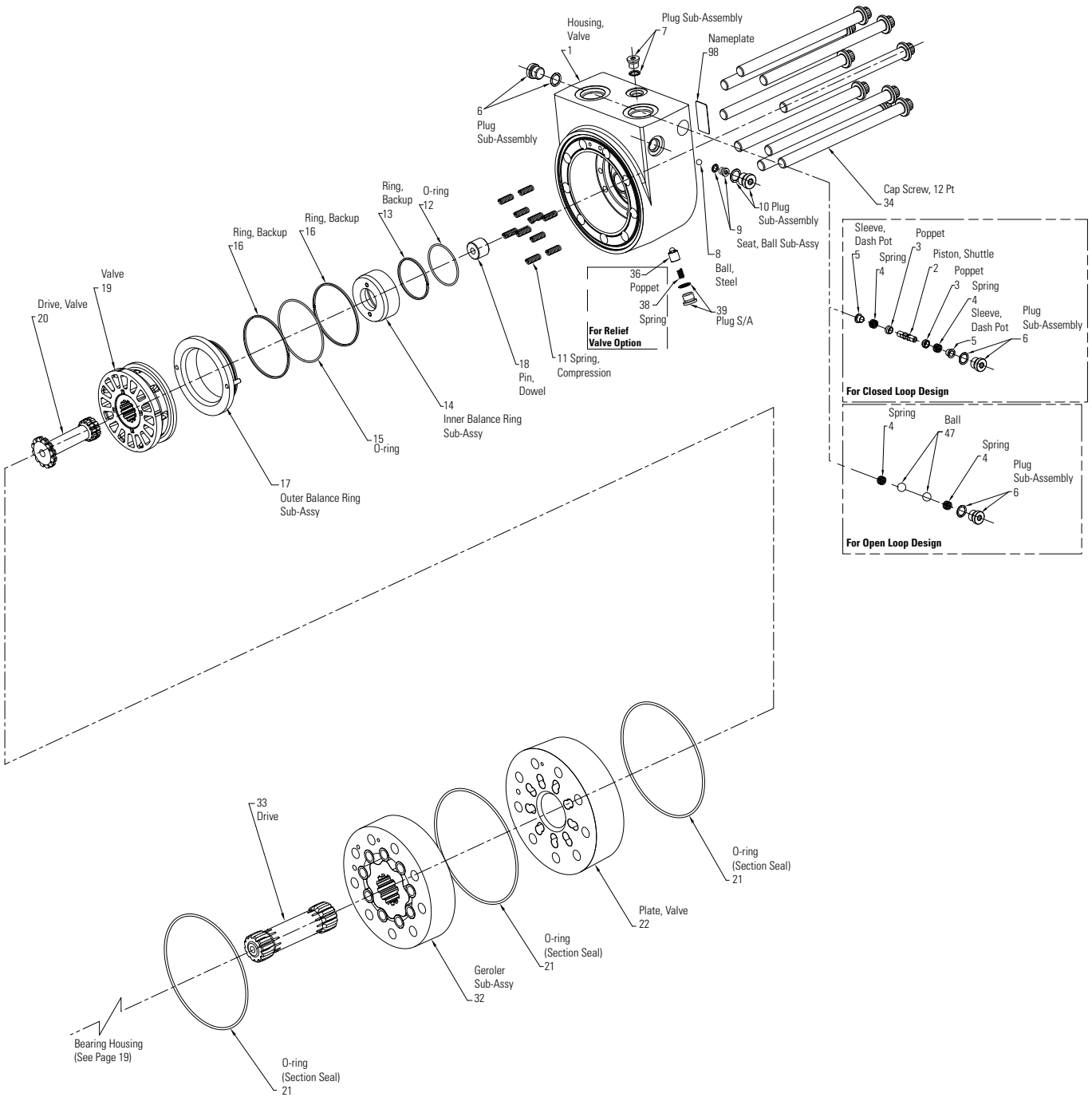
For more detailed information, please contact:

Eaton's Hydraulics Operations
14615 Lone Oak Road
Eden Prairie, MN 55344

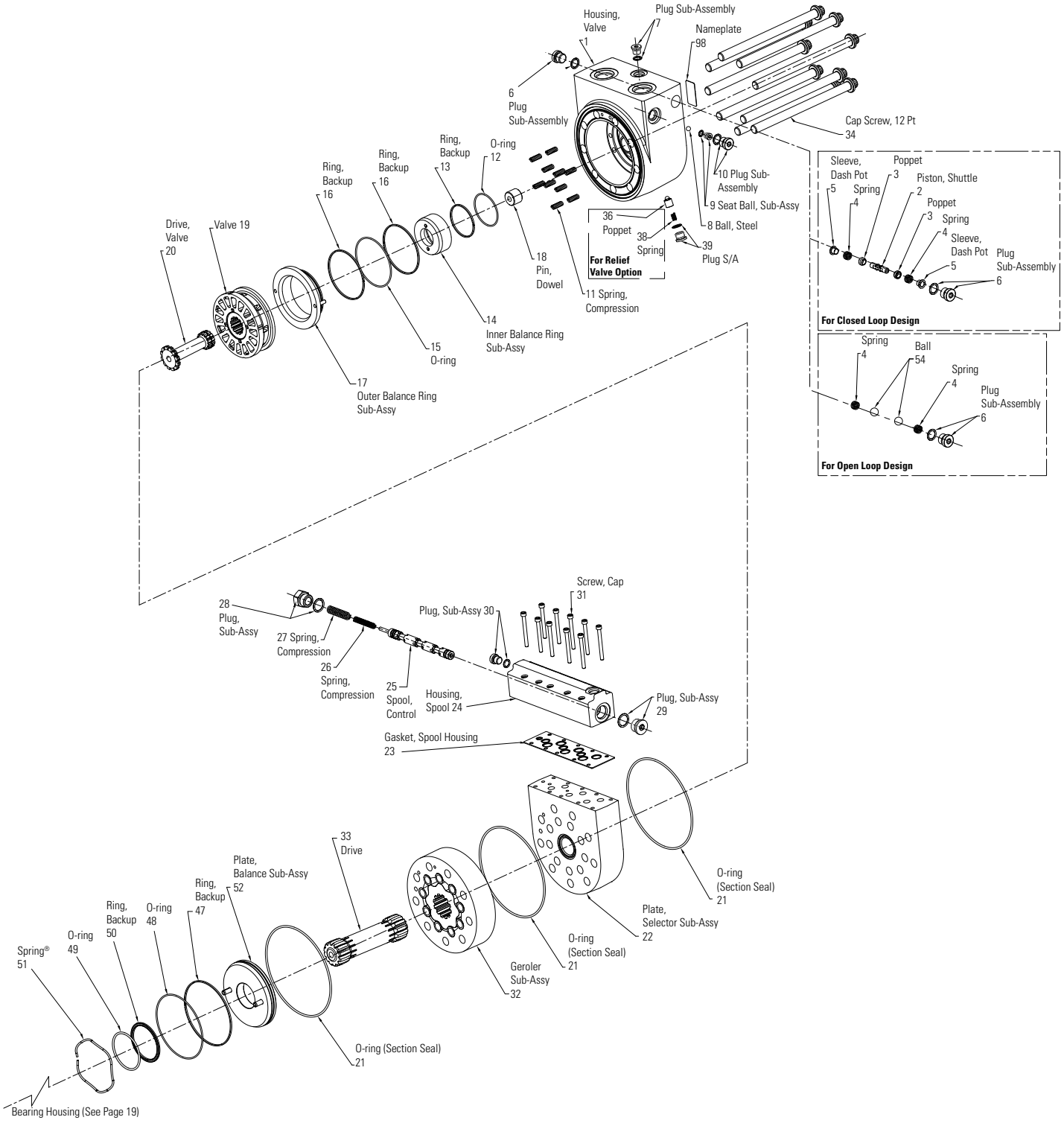
For Specification and Performance data, refer to catalog C-MOLO-TM012-E2



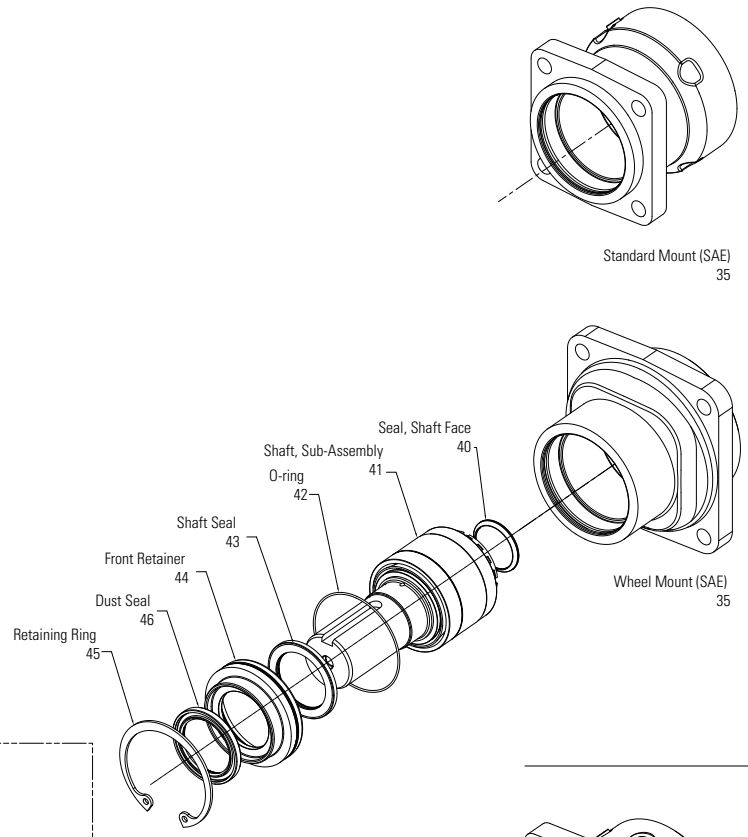
Exploded view
(Single Speed Standard and Wheel Motor)



Exploded view
(Two Speed Standard and Wheel Motor)

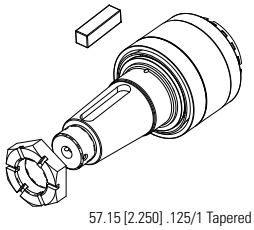


Exploded view
(Single and Two Speed Standard and Wheel Motor)

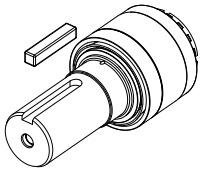


Standard Mount (SAE)
35

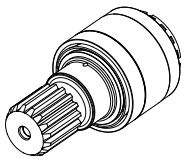
Wheel Mount (SAE)
35



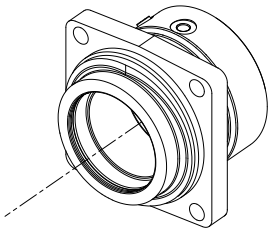
57.15 [2.250] .125/1 Tapered
41



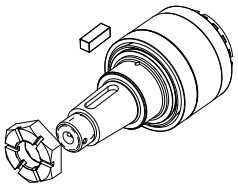
57.15 [2.250] Straight
41



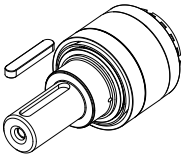
53.98 [2.125] 16T Splined
41



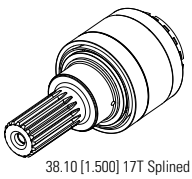
Standard Mount (SAE)
35



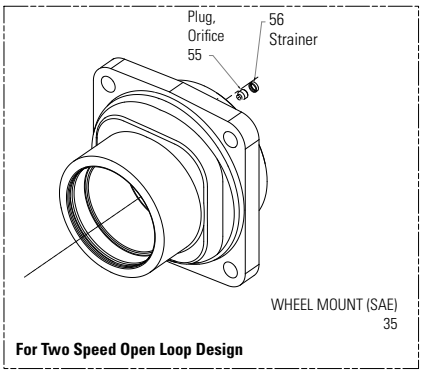
44.45 [1.750] .125/1 Tapered
41



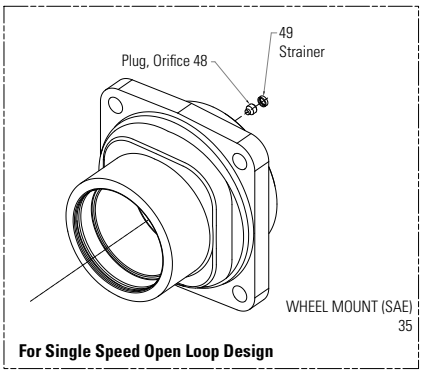
40.01 [1.575] Straight
41



38.10 [1.500] 17T Splined
41



For Two Speed Open Loop Design



For Single Speed Open Loop Design

Part list
(Single Speed Standard and Wheel Motor)

Item description

	Ref No.	Part No.	Description	Quantity
	1	5998727-001	Housing, Valve 1.0625-12 UN-2B SAE O-Ring Ports (2)	1
		5998727-007	Housing, Valve G 1 BSP Straight Thread Ports	1
	2	201494-002	Piston, Shuttle	1
	3	8567-000	Poppet	2
	4	230079-000	Spring	2
	5	112126-001	Sleeve, Dash Pot	2
	6	9266-006	Plug Sub-Assembly	2
X		250003-906	O-ring	2
	7	9266-006	Plug Sub-Assembly	1
X		250003-906	O-ring	1
	8	18026-000	Ball, Steel	1
	9	5992342-001	Seat, Ball Sub-Assy	1
X		250003-902	O-ring	1
	10	9266-006	Plug Sub-Assembly	1
X		250003-906	O-ring	1
	11	6203-000	Spring, Compression	10
X	12	14502-032	O-ring	1
X	13	5989483-001	Ring, Backup	1
	14	5991782-001	Inner Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
X	15	14502-040	O-ring	1
X	16	5989483-002	Ring, Backup	2
	17	5991783-001	Outer Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
	18	5987800-001	Pin, Dowel	1
	19	5987445-001	Valve	1
	20	5987844-001	Drive, Valve	1
X	21	250002-161	O-ring (Section Seal)	3
	22	5989335-001	Plate, Valve	1
	32	*	Geroler Sub-Assy	1
	33	*	Drive, Main	1
	34	*	Cap Screw, 12 PT	9
	35	5991796-018	Bearing Housing (Standard) Shuttle Valve With . 5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flange	1
		5991797-003	Bearing Housing (Wheel) Shuttle Valve With . 5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flange	1
		5992224-005	Bearing Housing (Standard) Shuttle Valve With G 1/4 BSP Straight Thread Case Drain Port In Mounting Flange	1
		5991797-002	Bearing Housing (Wheel) Check Valve With Orifice Plug, .5625-18 UNF-2B SAE O-Ring Case Drain Port In Valve Housing	1
	36	113538-001	Poppet (for relief valve unit only)	1
	38	113186-001	Spring (for relief valve unit only)	1
	39	9072-006	Plug Sub-Assembly	1
X		250003-905	O-ring	
X	40	9080-001	Seal, Shaft Face	1

Part list
(Single Speed Standard and Wheel Motor)

Item description

	Ref No.	Part No.	Description	Quantity
	41	6028182-003	Shaft, Sub-Assy(57.15mm .125/1 Tapered	1
		6028182-002	Shaft, Sub-Assy(57.15mm Straight)	1
		6028182-001	Shaft, Sub-Assy(53.98mm 16 Tooth Splined)	1
		6028182-007	Shaft, Sub-Assy(40.01mm Straight)	1
		6028182-008	Shaft, Sub-Assy(38.10mm 17 Tooth Splined)	1
X	42	112530-045	O-ring	1
X	43	14878-001	Shaft Seal	1
	44	5991645-002	Front Retainer	1
	45	16077-066	Retaining Ring	1
X	46	14850-001	Dust Seal	1
	47	285020-140	Ball (for open loop design only)	2
X	48	9289-001	Plug, Orifice (for open loop design only)	1
X	49	31500-452	Strainer (for open loop design only)	1
	62	9266-006	Plug Sub-Assembly	2
X		250003-906	O-ring	2
		9900846-000	Seal Kit - Contains Parts Indicated by X	

* = See Chart

Displacement	Ref. No. 32	Width	Ref. No. 33	Length	Ref. No. 34	Length
cm³/r [in3/r]	Geroler	mm [inch]	Drive	mm [inch]	Cap Screw	mm [inch]
343.8 [20.98]	5991701-001	32,1 [1.26]	5992182-001	130,4 [5.13]	114154-025	185,2 [7.29]
400.0 [24.40]	5991701-002	37,3 [1.47]	5992182-002	135,7 [5.34]	114154-026	190,5 [7.50]
434.2 [26.50]	5991701-006	40,6 [1.60]	5992182-006	138,9 [5.47]	114154-026	190,5 [7.50]
479.5 [29.26]	5991701-003	44,7 [1.76]	5992182-003	143,1 [5.63]	114154-027	197,9 [7.79]
677.3 [41.33]	5991701-007	63,2 [2.49]	5992182-008	161,2 [6.35]	114154-029	216,4 [8.52]

Part list
(Two Speed Standard and Wheel Motor)

Item description

	Ref No.	Part No.	Description	Quantity
	1	5998727-001	Housing, Valve 1.0625-12 UN-2B SAE O-Ring Ports (2)	1
		5998727-004	Housing, Valve 1.3125-12 UN-2B SAE O-Ring Ports (2)	1
		5998727-007	Housing, Valve G 1 BSP Straight Thread Ports	1
	2	201494-002	Piston, Shuttle	1
	3	8567-000	Poppet	2
	4	230079-000	Spring	2
	5	112126-001	Sleeve, Dash Pot	2
	6	9266-006	Plug Sub-Assembly	2
X		250003-904	O-ring	2
	7	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	8	18026-000	Ball, Steel	1
	9	5992342-001	Seat, Ball Sub-Assy	1
X		250003-902	O-ring	1
	10	9266-006	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	11	6203-000	Spring, Compression	10
X	12	14502-032	O-ring	1
X	13	5989483-001	Ring, Backup	1
	14	5991782-001	Inner Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
X	15	14502-040	O-ring	1
X	16	5989483-002	Ring, Backup	2
	17	5991783-001	Outer Balance Ring Sub-Assy	1
		268009-005	Pin, Roll	2
	18	5987800-001	Pin, Dowel	1
	19	5987445-001	Valve	1
	20	5987844-001	Drive, Valve	1
X	21	250002-161	O-ring (Section Seal)	3
	22	5991781-001	Plate, Selector Sub-Assy	1
		5989384-001	Insert, Sleeve	1
X	23	5990046-001	Gasket, Spool Housing	1
	24	5989326-002	Housing, Spool	1
	25	112850-002	Spool, Control	1
	26	112211-001	Spring, Compression	1
	27	114587-001	Spring, Compression	1
	28	9151-002	Plug Sub-Assembly	1
X		250003-908	O-ring	1
	29	9072-006	Plug Sub-Assembly	1
X		250003-908	O-ring	1
	30	9266-003	Plug Sub-Assembly	1
X		250003-904	O-ring	1
	31	16148-320	Screw, Cap	10
	32	*	Geroler Sub-Assy	1
	33	*	Drive, Main	1
	34	*	Cap Screw, 12 PT	9

Part list
(Two Speed Standard and Wheel Motor)

Item description

	Ref No.	Part No.	Description	Quantity	
	35		5991796-020	Bearing Housing (Standard) Shuttle Valve With .5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flanget	1
			5991797-004	Bearing Housing (Wheel) Shuttle Valve With .5625-18 UNF-2B SAE O-Ring Case Drain Port In Mounting Flange	1
			5992224-009	Bearing Housing (Standard) Shuttle Valve With G 1/4 BSP Straight Thread Case Drain Port In Mounting Flange	1
			5991797-005	Bearing Housing (Wheel) Check Valve With Orifice Plug, G 1/4 BSP Straight Thread Case Drain Port In Valve Housing	1
	36		113538-001	Poppet (for relief valve unit only)	1
	38		113186-001	Spring (for relief valve unit only)	1
	39		9072-006	Plug Sub-Assembly	1
X			250003-905	O-ring	1
X	40		9080-001	Seal, Shaft Face	1
	41		6028182-003	Shaft, Sub-Assy(57.15mm .125/1 Tapered)	1
			6028182-002	Shaft, Sub-Assy(57.15mm Straight)	1
			6028182-001	Shaft, Sub-Assy(53.98mm 16 Tooth Splined)	1
			6028182-015	Shaft, Sub-Assy(44.45mm .125/1 Tapered)	1
			6028182-007	Shaft, Sub-Assy(40.01mm Straight)	1
			6028182-008	Shaft, Sub-Assy(38.10mm 17 Tooth Splined)	1
	42		112530-045	O-ring	1
	43		14878-001	Shaft Seal	1
	44		5991645-002	Front Retainer	1
	45		16077-066	Retaining Ring	1
	46		14850-001	Dust Seal	1
X	47		5989483-004	Ring, Backup	1
X	48		112530-044	O-ring	1
X	49		112530-139	O-ring	1
X	50		14649-003	Ring, Backup	1
	51		6023120-001	Spring, Wavo	1
	52		6023947-001	Plate, Balance Sub-Assy	1
	53		9266-006	Plug Sub-Assembly	1
X			250003-904	O-ring	1
	54		285020-140	Ball (for open loop design only)	2
X	55		9289-001	Plug, Orifice (for open loop design only)	1
X	56		31500-452	Strainer (for open loop design only)	
			9900986-000	Seal Kit - Contains Parts Indicated by X	1

* = See Chart

Displacement	Ref. No. 32	Width	Ref. No. 33	Length	Ref. No. 34	Length
cm³/r [in3/r]	Geroler	mm [inch]	Drive	mm [inch]	Cap Screw	mm [inch]
343.8 [20.98]	5991701-001	32,1 [1.26]	5992182-001	130,4 [5.13]	114154-025	185,2 [7.29]
400.0 [24.40]	5991701-002	37,3 [1.47]	5992182-002	135,7 [5.34]	114154-026	190,5 [7.50]
434.2 [26.50]	5991701-006	40,6 [1.60]	5992182-006	138,9 [5.47]	114154-026	190,5 [7.50]
479.5 [29.26]	5991701-003	44,7 [1.76]	5992182-003	143,1 [5.63]	114154-027	197,9 [7.79]
677.3 [41.33]	5991701-007	63,2 [2.49]	5992182-008	161,2 [6.35]	114154-029	216,4 [8.52]

Disassembly
(Single and Two Speed Standard and Wheel Motor)

Tools required

- 7/32 inch Hex Key (Relief Valve Plug)
- 1/4 inch Hex Key (Shuttle Valve Plug)
- 5/16 inch Hex Key (Spool Housing Plug)
- 5/32 inch Hex Key (Spool Housing Screw, Cap)
- 7/8 Socket
- 9/16 Socket (12 Point Drive)
- Torque wrench - 142 Nm [1260 lb-in] capacity

8.0 Disassembly

8.0.1 Cleanliness is extremely important when repairing hydraulic motors. Work in a clean area. Before disconnecting the hydraulic motor thoroughly clean the exterior. Remove motor from application and drain the oil from the motor before disassembly.

8.0.2 Remove the 9 cap screws and disassemble the motor in the vertical position as shown in Figure 8A and 8B.

8.0.3 Remove shuttle valve (and relief valve if applicable) from Valve Housing.

8.0.4 Check all mating surfaces. To reduce the chance of leakage, replace any parts that have scratches or burrs. Wash all metal parts in clean solvent. Blow them dry with pressurized air. Do not wipe parts dry with paper towels or cloth as lint in a hydraulic system will cause damage.

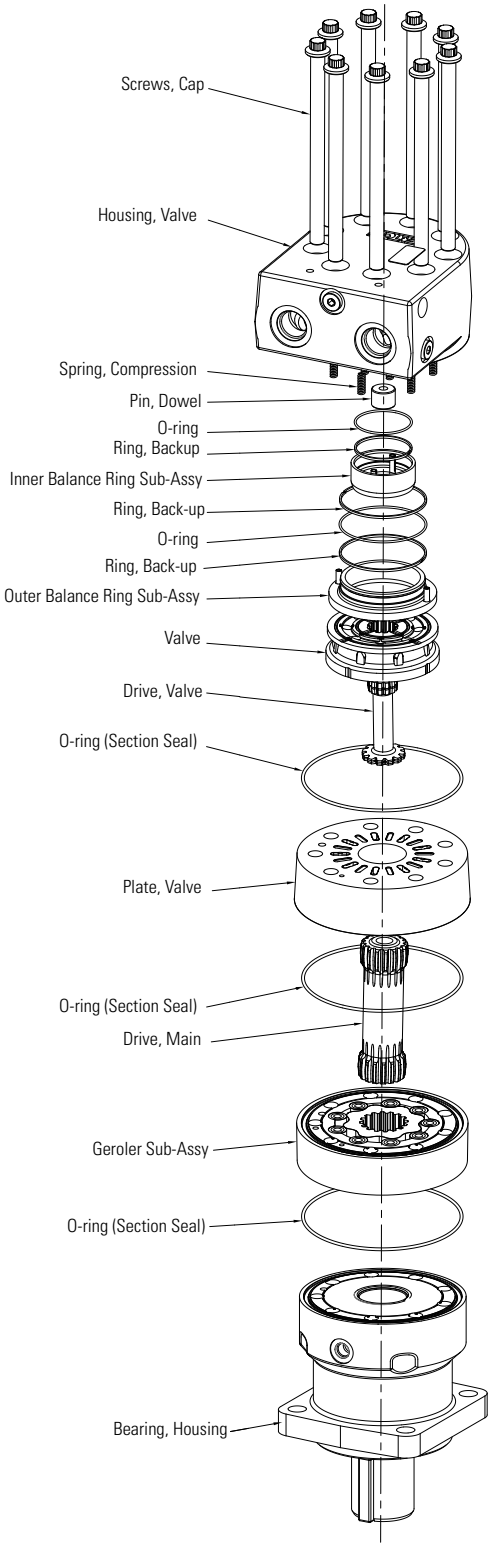


Figure 8A

(Single Speed standard and Wheel Motor)

Disassembly
(Single and Two Speed Standard and Wheel Motor)

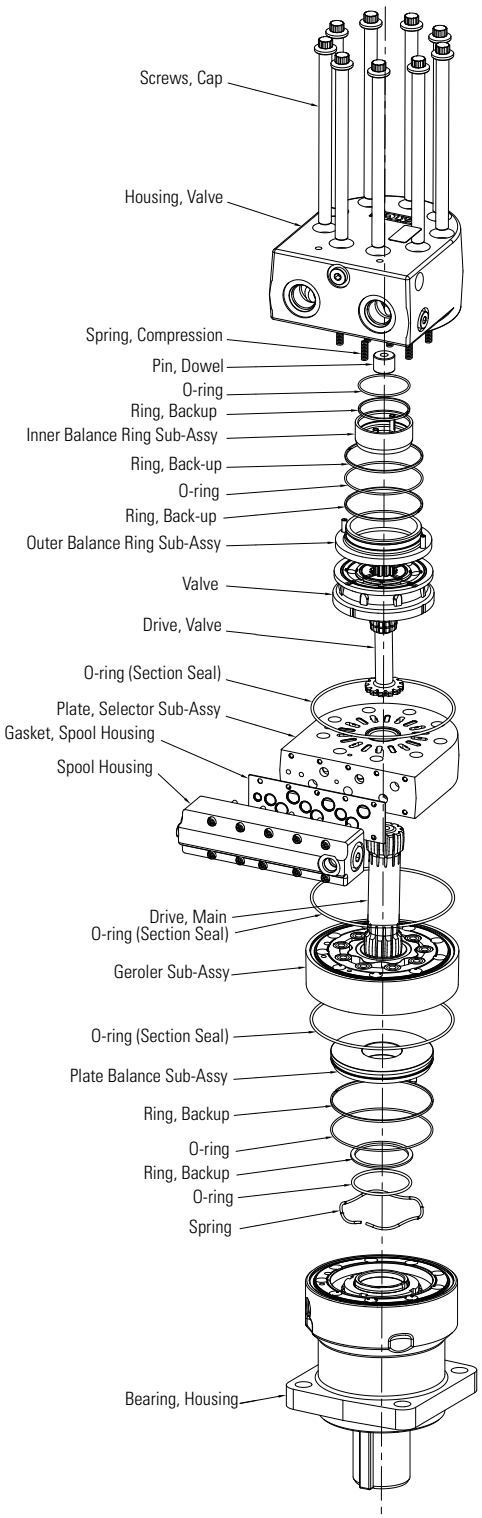


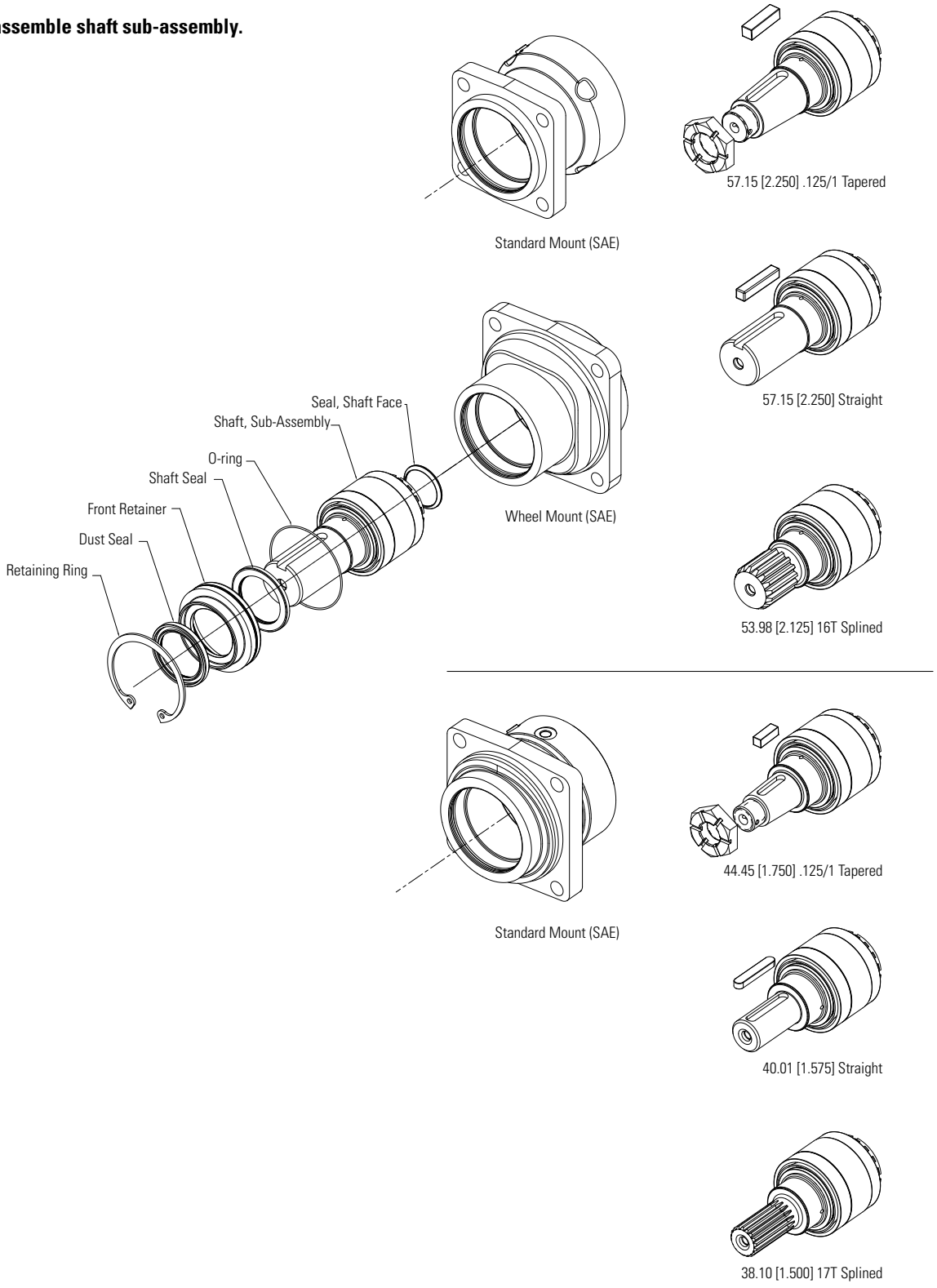
Figure 8B

(Two Speed standard and Wheel Motor)

8.5 Disassembly Geroler Motors

8.5.1 Disassemble bearing housing (3 bearing housings, and 6 shaft sub-assembly options are shown).

Note: Do NOT disassemble shaft sub-assembly.



Reassembly

(Single and Two Speed Standard and Wheel Motor)

Note: Always use new seals when reassembling hydraulic motors.Refer to parts list for seal kit number and replacement parts.

Important: During reassembly, lubricate the new seals with a petroleum jelly such as Vaseline®. Also lubricate machined surfaces with clean hydraulic fluid.

9.0 Valve housing assembly

9.0.1 Install one poppet, spring, dash pot and threaded internal hex plug with O-ring into shuttle valve bore from one end of Valve Housing.

9.0.2 Install shuttle piston from opposite end of shuttle valve cavity.

9.0.3 Install one shuttle valve poppet, spring, dash pot onto piston and threaded internal hex plug with O-ring from opposite end of shuttle valve cavity.

9.0.4 Shuttle plug threads may have light coat of oil or preservative. Torque both plugs to 360 +/- 36 lbf-in.

9.0.5 For a motor with open loop design, Install Ball, Spring and threaded internal hex plug with O-ring form one end of cavity. And then install another Ball, Spring and threaded internal hex plug with O-ring from opposite end of cavity. Torque both plugs to 360 +/- 36 lbf-in. Plugs may have light coat of oil or preservative.

9.0.6 For a motor with low pressure relief valve, install poppet, spring and plug. Plug threads may have light coat of oil or preservative. Torque plug to 180+/-18 lb-in.

9.0.7 For a motor without low-pressure relief valve, Install and torque plug to 180 ± 18 lbf-in. Plug may have light coat of oil or preservative.

9.0.8 Install ball and seat ball sub-assembly. Torque seat to 60 +/- 6 lbf-in. Install plug sub-assembly and torque to 360 +/- 36 lbf-in.

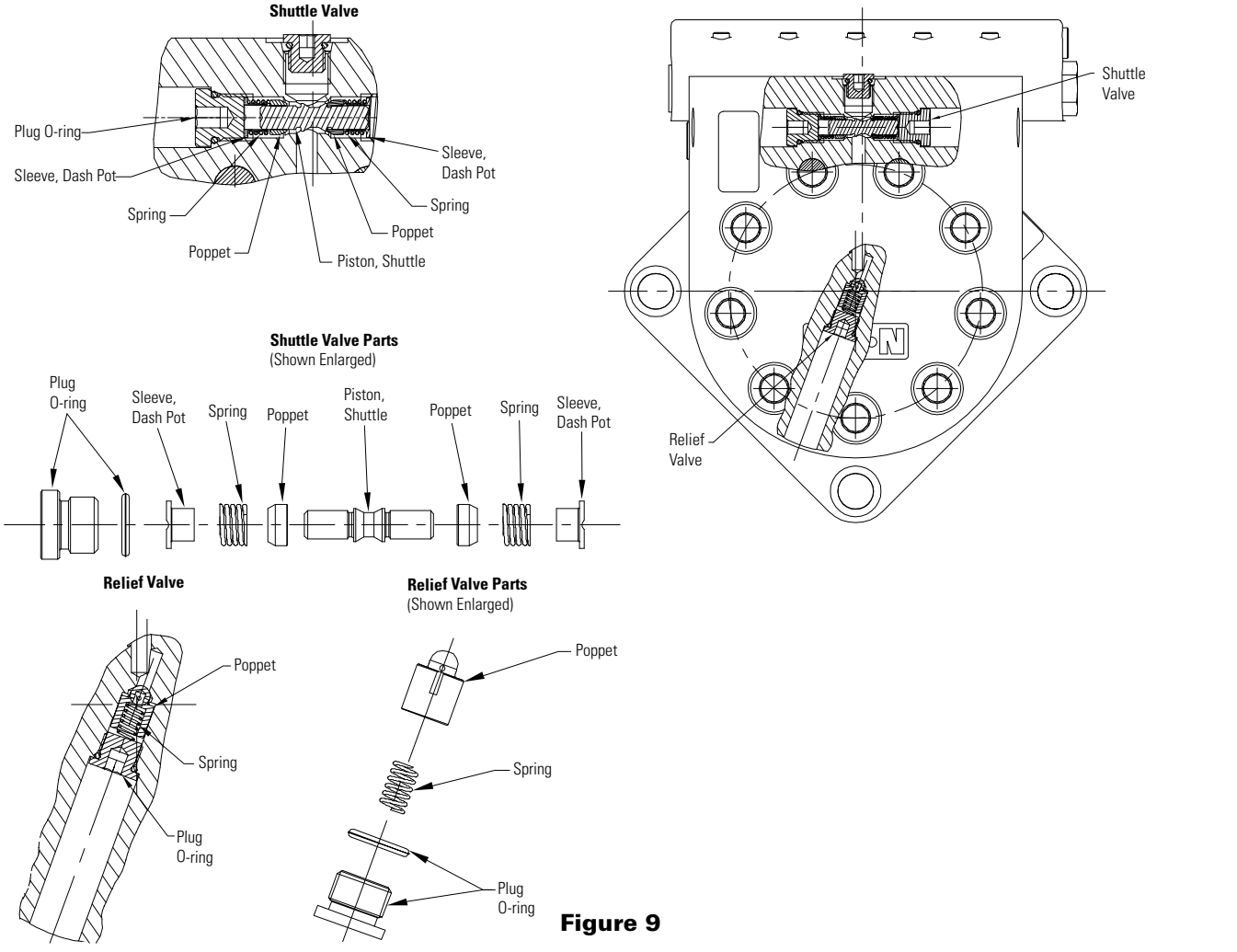


Figure 9

Reassembly
(Single and Two Speed Standard and Wheel Motor)

9.1 Outer balance ring assembly

9.1.1 Install one backup ring (75,1 [2.96] OD), then one O-ring (72,7 [2.86] ID) followed by one backup ring (75,1 [2.96] OD) into the O-ring groove in the outer balance ring. Seals and backups are to be greased. Ensure splits in backup rings are mated correctly. Location of splits in backup rings should not be aligned, a minimum of 90 degrees of separation is recommended.

9.1.2 Install one O-ring (47,3 [1.86] ID) then one backup ring (48,6 [1.91] OD) into the inner balance ring groove, located in the valve housing. Seal and backup are to be greased. Ensure split in backup ring is mated correctly.

9.1.3 Grease dowel pin and install in valve housing.

9.1.4 Install 10 balance ring springs in valve housing.

9.1.5 Install inner and outer balance ring sub-assemblies into valve housing. Ensure O-rings seals are seated.

9.1.6 Install greased O-ring section seal (139,4 [5.49] ID) in valve housing O-ring groove.

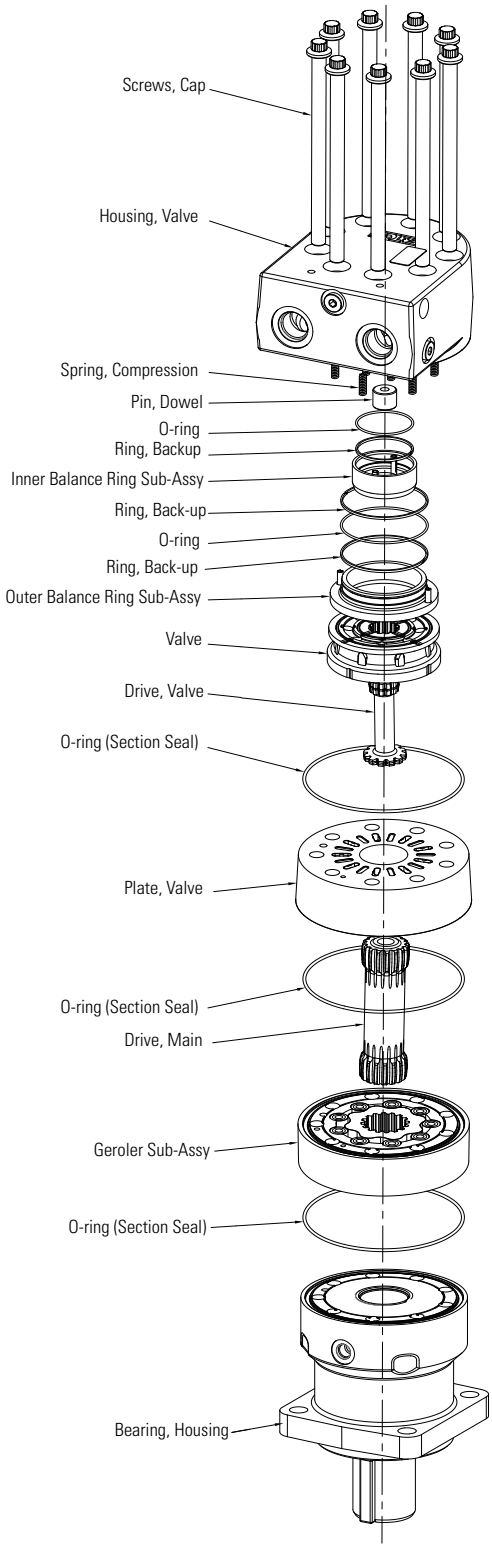


Figure 10A

(Single Speed standard and Wheel Motor)

Reassembly
(Single and Two Speed Standard and Wheel Motor)

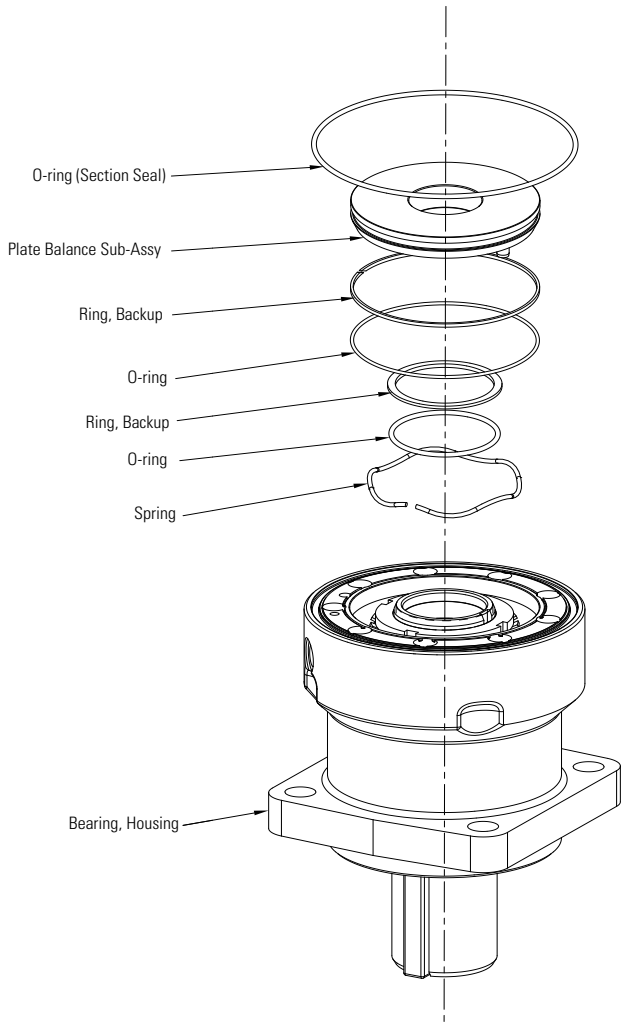


Figure 11

(Two Speed standard and Wheel Motor)

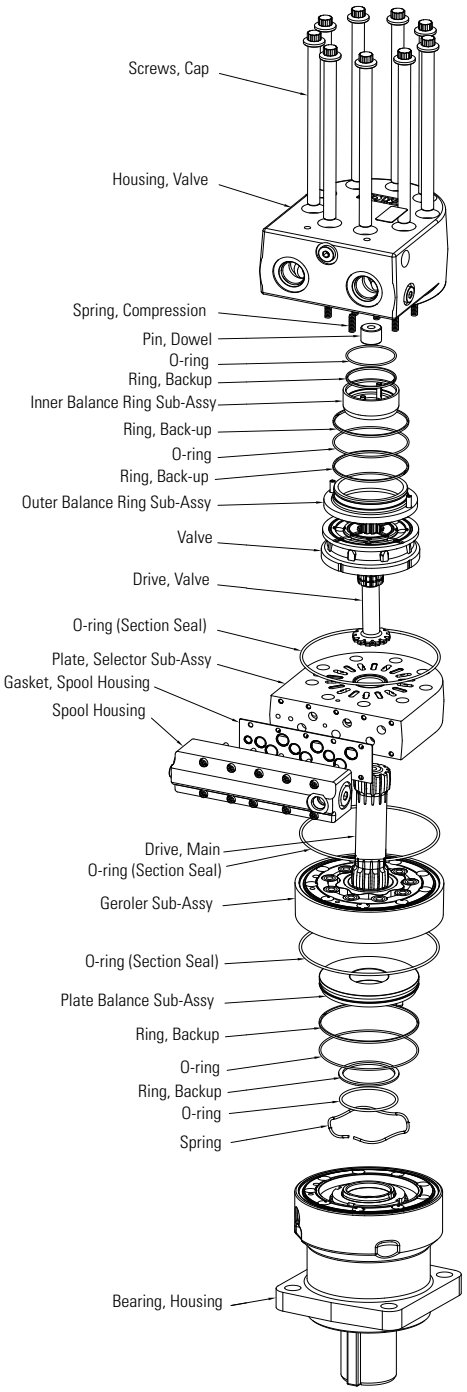


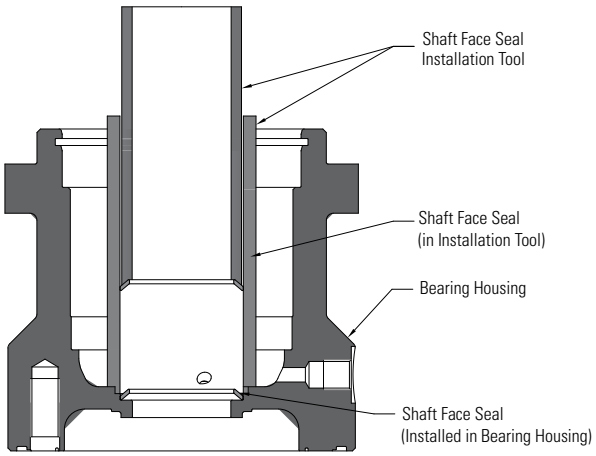
Figure 10B

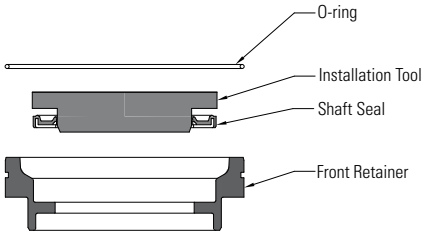
(Two Speed standard and Wheel Motor)

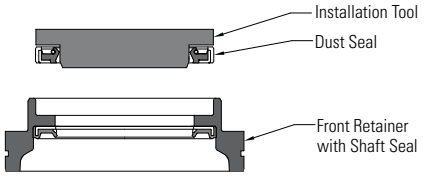
Reassembly
(Single and Two Speed Standard and Wheel Motor)

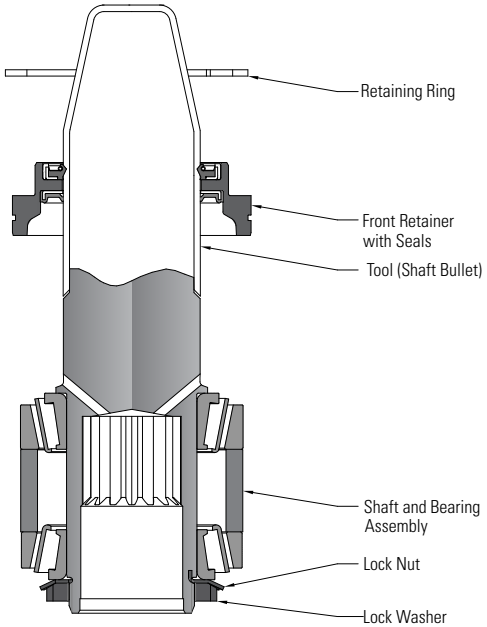
Note: Always use new seals when reassembling hydraulic motors. Refer to parts list for seal kit number, replacement parts, and ordering information.

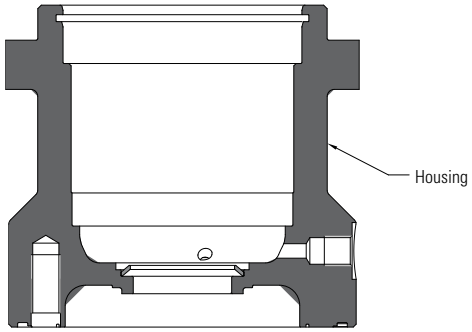
Important: During reassembly, lubricate the new seals with a petroleum jelly such as Vaseline®. Also lubricate machined surfaces with clean hydraulic fluid.











9.1.7 Install Teflon shaft face seal into bearing housing. Use an installation tool as shown, lubricate seal with Mobilith EP-111 grease or petroleum jelly (e.g. Vaseline) and compress seal into place.

9.1.8 Lightly lubricate seal with Mobilith EP-111 grease or petroleum jelly (e.g. Vaseline). Install in groove on front retainer.

9.1.9 Lightly Lubricate seal Shaft seal and dust seal lips with Mobilith EP-111 grease or petroleum jelly (e.g. Vaseline). Place seal on assembly tool, and press into bore of front retainer. Press until seal makes positive stop with front retainer shoulder. Protect inside diameter shaft seal area from damage.

9.1.10 Invert the front retainer, place dust seal on assembly tool, and press into bore of front retainer. Press until seal makes positive stop with front retainer shoulder. Protect inside diameter dust seal area from damage.

9.1.11 Install shaft/bearing sub-assembly into housing with press force of 3300 +/- 200 Lbf.

9.1.12 Before installing retainer, place a protective sleeve of bullet over shaft. Grease inside diameter of shaft seal. To prevent damage to seal, install front retainer over shaft with a twisting motion. Do not cut or distort shaft seal. Damage to shaft seal will cause external leakage. After installing front retainer into bearing housing secure it with snap ring.

9.2 Final assembly (For single speed standard and wheel motor)

9.2.1 Install main drive with longest spline length (if asymmetric) into output shaft spline.

9.2.2 Place Geroler assembly (seal groove up) over Bearing Housing. Install greased O-ring section seal (139,4 [5.49] ID) in seal groove of Geroler assembly. Align shuttle flow hole of Geroler with shuttle flow hole of Bearing Housing.

9.2.3 Mark drive teeth that align (See Figure E) with dykem pen. Install valve drive into internal star spline (See Figure F or G for motor timing).

9.2.4 Install valve plate onto Geroler sub-assembly (valve plate valve slots up). Align shuttle flow hole of valve plate with shuttle flow hole of Geroler sub-assembly.

9.2.5 Install valve onto valve drive and selector plate assembly. Ensure long leakage groove is aligned with marked tooth on valve drive (see Figure H).

9.2.6 Carefully invert valve housing and place onto valve plate. Make sure that shuttle flow holes are aligned.

9.2.7 Install nine cap screws lubricated with DTE-26. Pre-torque each in a crisscross pattern (see Figure 14) to 80+/-10 lb-ft. Finally, in a crisscross pattern, tighten screws to 105+/-5 lb-ft.

9.2.8 Install two cap plugs in main ports (Optional).

9.2.9 Install key and hex nut into shaft if required.

9.3 Bearing housing assembly (For two speed standard and wheel motor)

9.3.1 With Bearing Housing O-ring grooves up (see Figure 11), install O-ring section seal (139,4 [5.49] ID) Bearing Housing. Install back-up ring (62,1 [2.45] OD) over O-ring (55,2 [2.18] ID) with flat side up. Back-up ring and O-rings may be greased to assist in retaining parts.

9.3.2 Install wavo spring in groove in Bearing Housing.

9.3.3 Install back-up ring (99,7 [3.93] OD) in groves of balance plate sub assembly and then install O-ring (95,0 [3.74] ID) over back-up ring from tapered side.

9.3.4 Install balance plate sub assembly in Bearing Housing with tapered side down.

9.3.5 Install plug at 43 degree from horizontal centerline while viewing from shaft end (balance plate port), see Figure 12. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

9.4 Spool housing assembly (For two speed bearingless motor)

9.4.1 Install control spool into spool housing by first lubricating control spool with DTE26. Install control spool into spool bore, verifying that the control spool moves freely in bore.

9.4.2 Install nested springs and counter bored plug into end of spool housing spool bore. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

9.4.3 Install plug in opposite end of spool bore. Plug may have light coat of oil or preservative. Torque plug to 46 +/-2 lbf-ft.

9.4.4 Install plug into spool housing port and torque to 192 +/- 19 lbf-in.

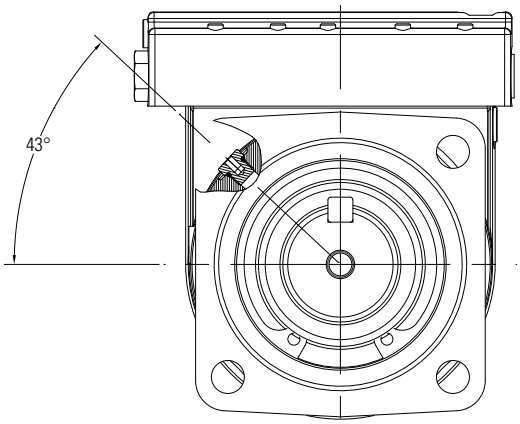


Figure 12

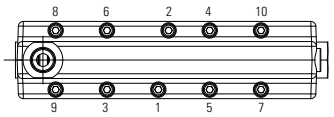


Figure 13

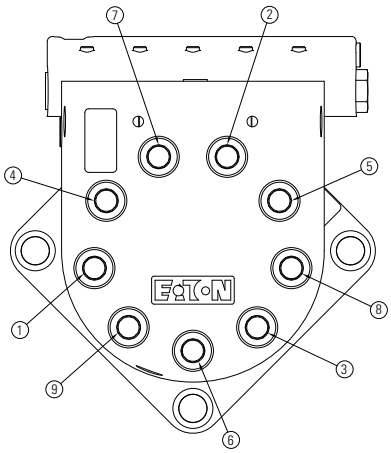


Figure 14

Reassembly
(Single and Two Speed Standard and Wheel Motor)

9.5 Selector plate assembly (For two speed bearing less motor)

9.5.1. Apply 1 drop of Loctite 290 in all 10 screw holes in the selector plate while ensuring that no air is trapped underneath the droplet. Install the gasket onto the selector plate. Place the spool housing assembly onto the gasket. Install and torque each of the 10 screws starting in the middle working outwards using the sequence in Figure 13. Torque each screw to 70 +/- 8 lbf-in.

9.6 Final assembly (For two speed standard and wheel motor)

9.6.1 Install main drive with longest spline length (if asymmetric) into output shaft spline.

9.6.2 Place Geroler assembly (seal groove up) over Bearing Housing. Install greased O-ring section seal (139,4 [5.49] ID) in seal groove of Geroler assembly. Align shuttle flow hole of Geroler with shuttle flow hole of Bearing Housing.

9.6.3 Mark drive teeth that align (See Figure E) with dykem pen. Install valve drive into internal star spline (See Figure F or G for motor timing).

9.6.4 Install selector plate onto Geroler sub-assembly (selector plate valve slots up). Align shuttle flow hole of selector plate with shuttle flow hole of Geroler sub-assembly.

9.6.5 Install valve onto valve drive and selector plate assembly. Ensure long leakage groove is aligned with marked tooth on valve drive (see Figure H).

9.6.6 Carefully invert valve housing and place onto selector plate. Make sure that shuttle flow holes are aligned.

9.6.7 Install nine cap screws lubricated with DTE-26. Pre-torque each in a crisscross pattern (see Figure 14) to 80+/-10 lb-ft. Finally, in a crisscross pattern, tighten screws to 105+/-5 lb-ft.

9.6.8 Install two cap plugs in main ports (Optional).

9.6.9 Install key and hex nut into shaft if required.

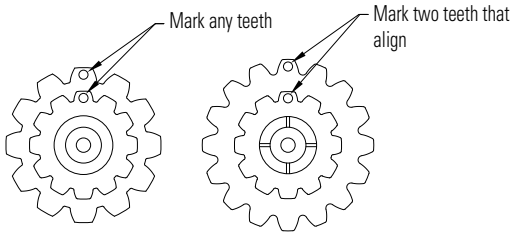


Figure E (Mark aligning teeth)

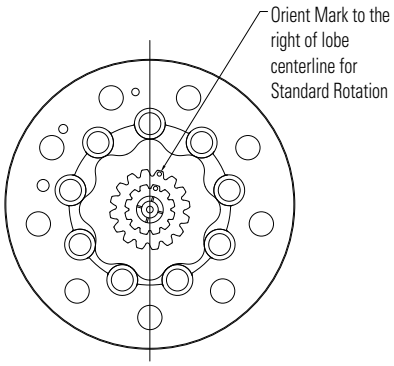


Figure F (Timing - Standard Rotation)

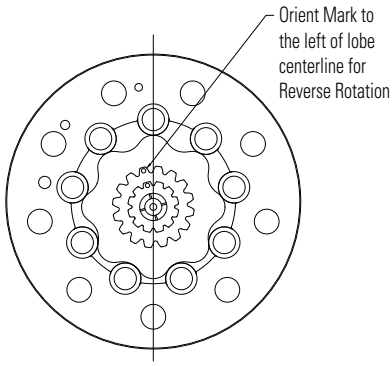


Figure G (Timing - Reverse Rotation)

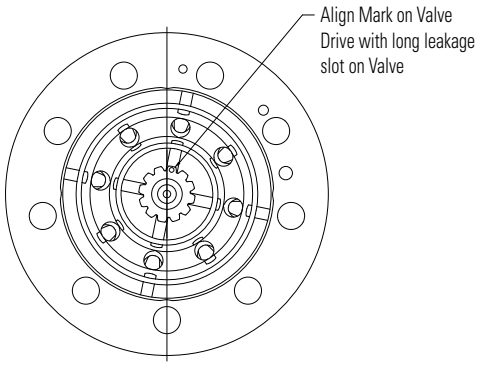


Figure H (Valve Orientation)

9.7 Speed Sensor

9.7.1 Rotate the motor shaft until a (gear/target) tooth is centered in the speed sensor port. If this is not done, the sensor may be damaged during the operation of the motor.

9.7.2 Make sure the locknut and its threads are clean and dry for the proper torque. Position the locknut against the alignment nut as shown in Figure 15.

9.7.3 Move the washer and the O-ring up as against the speed sensor body threads as shown in Figure 15.

9.7.4 By hand, lightly thread the speed sensor body into the housing until the sensor touches against the motor (gear/target) tooth. Do not force the sensor against the (gear/target) tooth, damage may occur. Make sure the O-ring or the washer do not touch housing – see Figure 16.

9.7.5 Turn the speed sensor body out one quarter turn (CCW) plus the additional amount (CCW) plus the additional amount (CCW) needed to make the alignment notches perpendicular to motor centerline (90° +/- 5 degrees from the motor shaft centerline – Figure 17 and 18).

9.7.6 Maintain the speed sensor body alignment (Figure 18), and tighten the locknut to 8.5–14 Nm [75-125 lb-in.] (torque values are for clean and dry threads).

9.7.7 Check the speed sensor body for correct alignment (Figure 18), reinstall the sensor if it is not correct.

Speed Sensor Installation

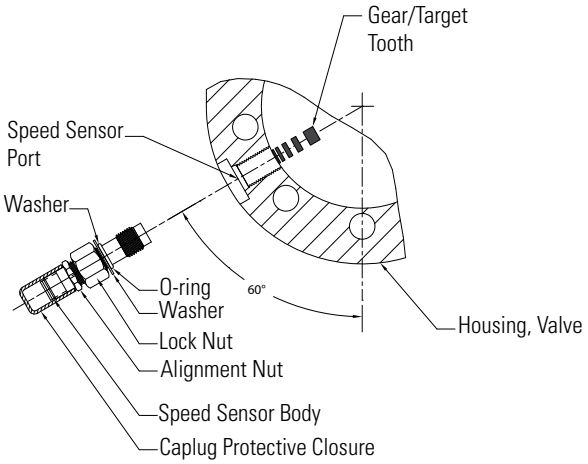


Figure 15

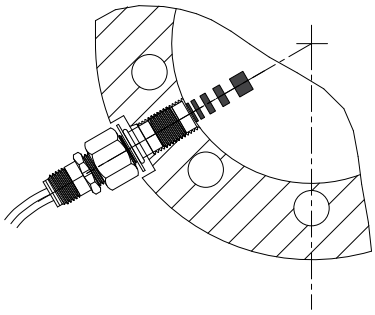


Figure 16

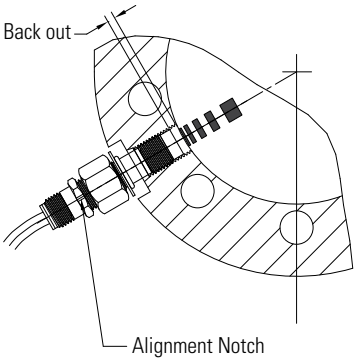


Figure 17

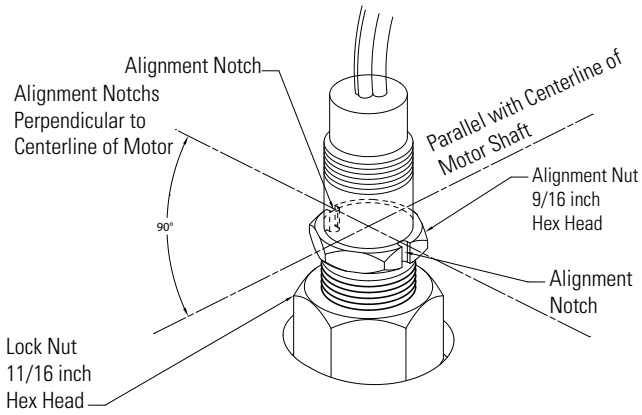
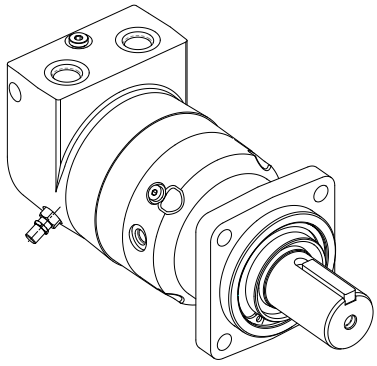

Alignment Notch
Alignment Notchs Perpendicular to Centerline of Motor
90°
Parallel with Centerline of Motor Shaft
Alignment Nut 9/16 inch Hex Head
Alignment Notch
Lock Nut 11/16 inch Hex Head

Figure 18



How to order replacement parts
(Single and two speed standard and wheel motor)

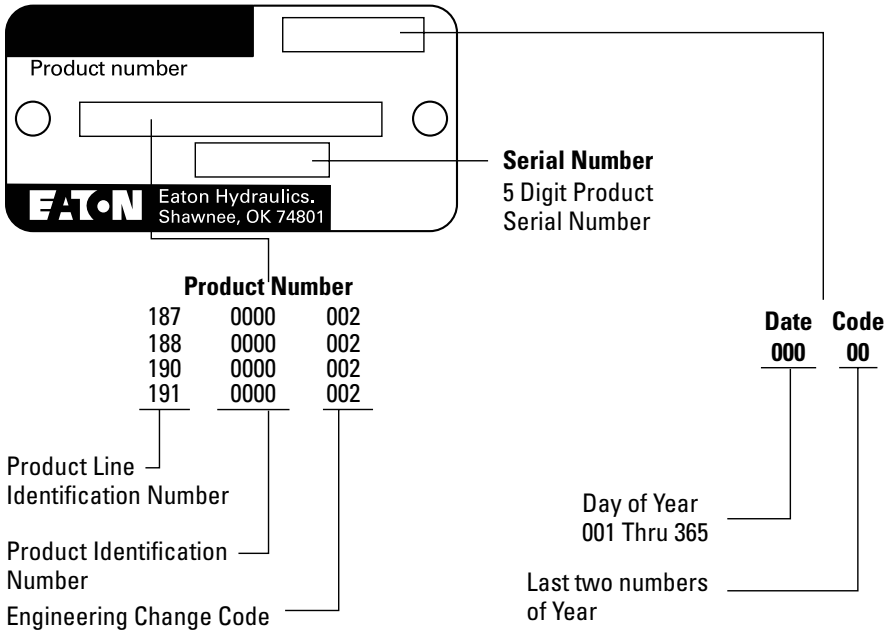
Each order must include the following:

Product Number
Date Code
Part Name
Part Number
Quantity of Parts

For more detailed information, please contact:

Eaton's Hydraulics Operations
14615 Lone Oak Road
Eden Prairie, MN 55344

For Specification and Performance data, refer to catalog C-MOLO-TM012-E2



Notes

Eaton
Hydraulics Group USA
Airflex Division
9919 Clinton Road
Cleveland, OH 44144-1077
Tel: 216-281-2211
Fax: 216-281-3890

Eaton
Hydraulics Group Asia Pacific
Airflex Division
281 Fa Sai Road
Waigaoqiao Free Trade Zone
Shanghai 200131
China
Tel: +8621) 5048-4811
Fax: +8621) 5048-4911

Eaton
Hydraulics Operations Europe
Route de la Longeraie 7 1110
Morges
Switzerland
Tel: +41 (0) 21 811 4600
Fax: +41 (0) 21 811 4601

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